

APÉNDICE D: TABLAS DE MEDICIONES REALIZADAS

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

POR:	Alfredo Florián Méndez
ASESORES:	M.C. Luis Gerardo Guerrero Ojeda (UDLAP)
	Dr. Alejandro Aragón Zavala (ITESM Qro.)
TOMA DE MEDICIONES EN LA LOGIA MASÓNICA DE OAXACA A 936 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA "φi"	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA "θi"	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX			Gt(φ+θ)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "L"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec de Regresión de Oaxaca	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema
								dBm	dB	dB						
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB	
1	320.361	2.15	5.3157	24.330	-0.55	936	-9.1	-97.6	-127.6	1.6	90.1	46.3768	43.7232	39.5980	45.2339	
1	332.319	2.15	4.6774	27.918	-0.55	936	-9.1	-94.6	-124.6	1.6	87.1	45.2656	41.8344	39.7708	46.7242	
1	354.608	2.15	4.5055	29.083	-0.45	936	-9.1	-93.5	-123.5	1.7	86.1	44.9403	41.1597	39.8174	47.2079	
1	343.528	2.15	4.8595	26.786	-0.55	936	-9.1	-99.7	-129.7	1.6	92.2	45.5973	46.6027	39.7215	46.2542	
1	334.421	2.15	5.1657	25.084	-0.55	936	-9.1	-99.1	-129.1	1.6	91.6	46.1282	45.4718	39.6386	45.5472	
1	329.995	2.15	5.3847	23.998	-0.65	936	-9.1	-93.6	-123.6	1.5	86	46.4888	39.5112	39.5794	45.0962	
1	321.999	2.15	5.6101	22.977	-0.65	936	-9.1	-94.3	-124.3	1.5	86.7	46.8450	39.8550	39.5183	44.6723	
1	324.249	2.15	6.3300	20.241	-0.75	936	-9.1	-98.2	-128.2	1.4	90.5	47.8936	42.6064	39.3235	43.5359	
1	349.274	2.15	5.1134	25.359	-0.55	936	-9.1	-92.7	-122.7	1.6	85.2	46.0398	39.1602	39.6528	45.6612	
1	358.074	2.15	4.9709	26.140	-0.55	936	-9.1	-89.6	-119.6	1.6	82.1	45.7943	36.3057	39.6914	45.9856	
1	7.237	2.15	4.3949	29.888	-0.45	936	-9.1	-98.9	-128.9	1.7	91.5	44.7244	46.7756	39.8473	47.5423	
1	30.751	2.15	4.7063	27.732	-0.55	936	-9.1	-94.6	-124.6	1.6	87.1	45.3191	41.7809	39.7630	46.6468	
1	43.452	2.15	5.6742	22.703	-0.65	936	-9.1	-99.5	-129.5	1.5	91.9	46.9435	44.9565	39.5010	44.5585	
1	49.512	2.15	6.4079	19.985	-0.75	936	-9.1	-97.4	-127.4	1.4	89.7	47.9998	41.7002	39.3024	43.4294	
1	33.182	2.15	5.4644	23.627	-0.65	936	-9.1	-95.1	-125.1	1.5	87.5	46.6164	40.8836	39.5578	44.9419	
1	13.109	2.15	5.0021	25.965	-0.55	936	-9.1	-97.2	-127.2	1.6	89.7	45.8485	43.8515	39.6829	45.9129	
1	22.235	2.15	5.5992	23.024	-0.65	936	-9.1	-100.8	-130.8	1.5	93.2	46.8281	46.3719	39.5213	44.6919	
1	36.057	2.15	6.0508	21.219	-0.65	936	-9.1	-100.7	-130.7	1.5	93.1	47.5018	45.5982	39.3991	43.9421	
1	40.401	2.15	6.8840	18.550	-0.75	936	-9.1	-101.3	-131.3	1.4	93.6	48.6224	44.9776	39.1735	42.8335	
1	47.342	2.15	7.2595	17.558	-0.75	936	-9.1	-100.6	-130.6	1.4	92.9	49.0836	43.8164	39.0719	42.4217	
1	57.804	2.15	7.0491	18.100	-0.75	936	-9.1	-101	-131	1.4	93.3	48.8282	44.4718	39.1288	42.6468	
1	60.127	2.15	8.0532	15.780	-0.85	936	-9.1	-102.8	-132.8	1.3	95	49.9849	45.0151	38.8570	41.6832	
1	63.521	2.15	9.1694	13.818	-0.85	936	-9.1	-103.1	-133.1	1.3	95.3	51.1123	44.1877	38.5548	40.8684	
1	67.855	2.15	10.1607	12.447	-0.85	936	-9.1	-104.1	-134.1	1.3	96.3	52.0040	44.2960	38.2865	40.2990	
1	68.509	2.15	11.1893	11.287	-0.75	936	-9.1	-106.9	-136.9	1.4	99.2	52.8416	46.3584	38.0081	39.8173	
1	58.472	2.15	8.8057	14.401	-0.85	936	-9.1	-102.7	-132.7	1.3	94.9	50.7608	44.1392	38.6533	41.1104	
1	54.268	2.15	7.8626	16.173	-0.75	936	-9.1	-99.9	-129.9	1.4	92.2	49.7769	42.4231	38.9086	41.8463	
1	52.410	2.15	8.5634	14.817	-0.85	936	-9.1	-101.1	-131.1	1.3	93.3	50.5185	42.7815	38.7189	41.2835	
1	61.908	2.15	10.4675	12.077	-0.85	936	-9.1	-104.2	-134.2	1.3	96.4	52.2624	44.1376	38.2034	40.1452	
1	65.212	2.15	12.3127	10.245	-0.75	936	-9.1	-104.6	-134.6	1.4	96.9	53.6726	43.2274	37.7040	39.3847	
1	72.505	2.15	12.5337	10.063	-0.75	936	-9.1	-106.4	-136.4	1.4	98.7	53.8271	44.8729	37.6441	39.3089	
1	71.749	2.15	13.0212	9.682	-0.75	936	-9.1	-104.6	-134.6	1.4	96.9	54.1586	42.7414	37.5122	39.1509	
1	76.129	2.15	15.3399	8.208	-0.75	936	-9.1	-104.6	-134.6	1.4	96.9	55.5820	41.3180	36.8845	38.5385	
1	76.417	2.15	16.4117	7.668	-0.75	936	-9.1	-104.6	-134.6	1.4	96.9	56.1686	40.7314	36.5943	38.3145	
1	74.536	2.15	15.5319	8.106	-0.75	936	-9.1	-101	-131	1.4	93.3	55.6900	37.6100	36.8325	38.4961	
1	70.287	2.15	13.7826	9.143	-0.75	936	-9.1	-103.9	-133.9	1.4	96.2	54.6521	41.5479	37.3060	38.9268	
1	70.259	2.15	14.3202	8.797	-0.75	936	-9.1	-102.5	-132.5	1.4	94.8	54.9845	39.8155	37.1605	38.7831	
1	70.226	2.15	15.1743	8.298	-0.75	936	-9.1	-104.6	-134.6	1.4	96.9	55.4877	41.4123	36.9293	38.5760	
1	71.904	2.15	15.6400	8.049	-0.75	936	-9.1	-105.6	-135.6	1.4	97.9	55.7503	42.1497	36.8032	38.4727	
1	72.447	2.15	16.9861	7.408	-0.75	936	-9.1	-105.2	-135.2	1.4	97.5	56.4674	41.0326	36.4389	38.2062	

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TOMA DE MEDICIONES EN EL INTERIOR DE LA LOGIA MASÓNICA DE OAXACA A 936 MHZ	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX	Gt(φ+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "L"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec de Regresión de Oaxaca	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema	
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	
0.8	209.745	2.15	5.6061	15.519	-0.85	936	-8.9	-87.8	-117.8	1.3	80.2	46.8388	33.3612	35.6008	33.7836
0.8	204.161	2.15	6.0525	14.349	-0.85	936	-8.9	-94	-124	1.3	86.4	47.5042	38.8958	35.4800	33.2977
0.8	207.635	2.15	4.7899	18.250	-0.75	936	-8.9	-90.2	-120.2	1.4	82.7	45.4720	37.2280	35.8218	34.9175
0.8	199.296	2.15	4.8670	17.951	-0.75	936	-8.9	-86.4	-116.4	1.4	78.9	45.6108	33.2892	35.8009	34.7933
0.8	197.216	2.15	5.4150	16.082	-0.75	936	-8.9	-90.2	-120.2	1.4	82.7	46.5375	36.1625	35.6526	34.0171
0.8	191.985	2.15	3.9552	22.287	-0.65	936	-8.9	-88.9	-118.9	1.5	81.5	43.8090	37.6910	36.0477	36.5941
0.8	187.914	2.15	5.0923	17.131	-0.75	936	-8.9	-91.4	-121.4	1.4	83.9	46.0038	37.8962	35.7399	34.4531
0.8	178.836	2.15	5.1446	16.952	-0.75	936	-8.9	-83.6	-113.6	1.4	76.1	46.0925	30.0075	35.7258	34.3786
0.8	176.730	2.15	4.7979	18.218	-0.75	936	-8.9	-84.4	-114.4	1.4	76.9	45.4866	31.4134	35.8196	34.9044
0.8	172.951	2.15	4.0373	21.810	-0.65	936	-8.9	-77.3	-107.3	1.5	69.9	43.9874	25.9126	36.0255	36.3962
0.8	153.172	2.15	7.9424	10.886	-0.75	936	-8.9	-67.2	-97.2	1.4	59.7	49.8646	9.8354	34.9684	31.8594
0.8	133.760	2.15	5.1258	17.016	-0.75	936	-8.9	-89.5	-119.5	1.4	82	46.0607	35.9393	35.7308	34.4051
0.8	137.490	2.15	6.0493	14.357	-0.85	936	-8.9	-86.2	-116.2	1.3	78.6	47.4996	31.1004	35.4809	33.3009
0.8	144.951	2.15	6.7169	12.904	-0.85	936	-8.9	-68.7	-98.7	1.3	61.1	48.4089	12.6911	35.3001	32.6974
0.8	141.304	2.15	7.6189	11.354	-0.75	936	-8.9	-72.3	-102.3	1.4	64.8	49.5034	15.2966	35.0560	32.0539
0.8	125.061	2.15	6.3255	13.718	-0.85	936	-8.9	-93.3	-123.3	1.3	85.7	47.8874	37.8126	35.4061	33.0353
0.8	123.061	2.15	7.2329	11.969	-0.75	936	-8.9	-91	-121	1.4	83.5	49.0517	34.4483	35.1605	32.3092
0.8	128.710	2.15	7.3191	11.826	-0.75	936	-8.9	-90.7	-120.7	1.4	83.2	49.1546	34.0454	35.1371	32.2498
0.8	135.526	2.15	7.8524	11.013	-0.75	936	-8.9	-77.3	-107.3	1.4	69.8	49.7656	20.0344	34.9928	31.9119
0.8	139.435	2.15	8.7258	9.899	-0.75	936	-8.9	-76.6	-106.6	1.4	69.1	50.6816	18.4184	34.7563	31.4493
0.8	118.227	2.15	7.5505	11.459	-0.75	936	-8.9	-95.6	-125.6	1.4	88.1	49.4251	38.6749	35.0745	32.0972
0.8	130.651	2.15	8.8925	9.711	-0.75	936	-8.9	-85.5	-115.5	1.4	78	50.8460	27.1540	34.7112	31.3714
0.8	123.672	2.15	8.9464	9.652	-0.75	936	-8.9	-87	-117	1.4	79.5	50.8985	28.6015	34.6966	31.3469
0.8	118.038	2.15	8.9971	9.597	-0.75	936	-8.9	-93.8	-123.8	1.4	86.3	50.9476	35.3524	34.6829	31.3241
0.8	125.935	2.15	10.1646	8.486	-0.75	936	-8.9	-93.7	-123.7	1.4	86.2	52.0073	34.1927	34.3668	30.8627
0.8	120.063	2.15	10.1522	8.497	-0.75	936	-8.9	-94	-124	1.4	86.5	51.9967	34.5033	34.3702	30.8671
0.8	114.074	2.15	9.9926	8.633	-0.75	936	-8.9	-97.2	-127.2	1.4	89.7	51.8591	37.8409	34.4134	30.9238
0.8	113.603	2.15	11.0912	7.773	-0.75	936	-8.9	-96.8	-126.8	1.4	89.3	52.7651	36.5349	34.1160	30.5664
0.8	119.227	2.15	11.0795	7.781	-0.75	936	-8.9	-87.4	-117.4	1.4	79.9	52.7559	27.1441	34.1192	30.5698
0.8	124.183	2.15	11.0662	7.790	-0.75	936	-8.9	-94.1	-124.1	1.4	86.6	52.7455	33.8545	34.1228	30.5737
0.8	155.711	2.15	7.8034	11.083	-0.75	936	-8.9	-96.2	-126.2	1.4	88.7	49.7112	38.9888	35.0060	31.9410
0.8	158.086	2.15	7.7034	11.228	-0.75	936	-8.9	-94.1	-124.1	1.4	86.6	49.5992	37.0008	35.0331	32.0015
0.8	159.910	2.15	7.9164	10.922	-0.75	936	-8.9	-94.9	-124.9	1.4	87.4	49.8360	37.5640	34.9754	31.8745
0.8	163.129	2.15	9.3895	9.193	-0.75	936	-8.9	-92.5	-122.5	1.4	85	51.3184	33.6816	34.5767	31.1561
0.8	164.503	2.15	10.2900	8.382	-0.75	936	-8.9	-91.2	-121.2	1.4	83.7	52.1138	31.5862	34.3329	30.8194
0.8	168.992	2.15	9.8037	8.801	-0.75	936	-8.9	-93.1	-123.1	1.4	85.6	51.6933	33.9067	34.4645	30.9935
0.8	167.925	2.15	8.0761	10.704	-0.75	936	-8.9	-86.9	-116.9	1.4	79.4	50.0095	29.3905	34.9322	31.7837
0.8	173.580	2.15	8.8031	9.811	-0.75	936	-8.9	-86.8	-116.8	1.4	79.3	50.7583	28.5417	34.7354	31.4128
0.8	180.288	2.15	8.1002	10.672	-0.75	936	-8.9	-95.2	-125.2	1.4	87.7	50.0354	37.6646	34.9257	31.7703
0.8	183.623	2.15	9.3001	9.282	-0.75	936	-8.9	-91.5	-121.5	1.4	84	51.2353	32.7647	34.6009	31.1931
0.8	143.941	2.15	4.2331	20.754	-0.75	936	-8.9	-94.2	-124.2	1.4	86.7	44.3986	42.3014	35.9725	35.9574
0.8	151.327	2.15	3.9437	22.356	-0.65	936	-8.9	-93.7	-123.7	1.5	86.3	43.7835	42.5165	36.0508	36.6228
0.8	155.624	2.15	3.8200	23.121	-0.65	936	-8.9	-92.9	-122.9	1.5	85.5	43.5068	41.9932	36.0843	36.9404
0.8	160.233	2.15	3.7165	23.804	-0.65	936	-8.9	-95.3	-125.3	1.5	87.9	43.2682	44.6318	36.1123	37.2241
0.8	164.957	2.15	3.6373	24.356	-0.55	936	-8.9	-88.8	-118.8	1.6	81.5	43.0810	38.4190	36.1338	37.4533
0.8	189.752	2.15	3.5767	24.796	-0.55	936	-8.9	-89.2	-119.2	1.6	81.9	42.9351	38.9649	36.1502	37.6361
0.8	155.723	2.15	4.5130	19.413	-0.75	936	-8.9	-95.6	-125.6	1.4	88.1	44.9548	43.1452	35.8967	35.4006
0.8	162.949	2.15	4.3267	20.285	-0.75	936	-8.9	-95.2	-125.2	1.4	87.7	44.5887	43.1113	35.9472	35.7626
0.8	189.079	2.15	4.2058	20.895	-0.75	936	-8.9	-89.2	-119.2	1.4	81.7	44.3425	37.3575	35.9799	36.0159
0.8	190.513	2.15	4.2217	20.812	-0.75	936	-8.9	-85.8	-115.8	1.4	78.3	44.3753	33.9247	35.9756	35.9817

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TOMA DE MEDICIONES EN EL MUNICIPIO DE OAXACA A 936 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "Φ"	GANANCIA Φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX		Gt(Φi+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Lr"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec. De Regresión de Oaxaca	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB
1.1	137.831	2.15	6.8904	49.892	-0.75	936	-9.5	-93.7	-123.7	1.4	85.6	48.6304	36.9696	41.1311	59.7457
1.1	90.000	2.15	5.7702	65.967	-3.05	936	-9.5	-95.9	-125.9	-0.9	85.5	47.0894	38.4106	41.4343	66.4216
1.1	124.941	2.15	6.4300	55.044	-1.25	936	-9.5	-101.7	-131.7	0.9	93.1	48.0298	45.0702	41.2557	61.8852
1.1	112.297	2.15	6.0664	60.311	-2.05	936	-9.5	-95.5	-125.5	0.1	86.1	47.5241	38.5759	41.3541	64.0725
1.1	125.713	2.15	6.9670	49.150	-0.75	936	-9.5	-95	-125	1.4	86.9	48.7264	38.1736	41.1103	59.4376
1.1	97.398	2.15	6.8826	49.969	-0.75	936	-9.5	-99.9	-129.9	1.4	91.8	48.6205	43.1795	41.1332	59.7778
1.1	110.175	2.15	7.3358	45.922	-0.45	936	-9.5	-93.6	-123.6	1.7	85.8	49.1745	36.6255	41.0105	58.0968
1.1	116.606	2.15	8.2111	39.927	-0.35	936	-9.5	-102	-132	1.8	94.3	50.1535	44.1465	40.7736	55.6073
1.1	102.767	2.15	7.5995	43.905	-0.35	936	-9.5	-105	-135	1.8	97.3	49.4812	47.8188	40.9391	57.2593
1.1	90.599	2.15	7.1150	47.790	-0.55	936	-9.5	-92.6	-122.6	1.6	84.7	48.9091	35.7909	41.0703	58.8726
1.1	84.958	2.15	6.1000	59.762	-1.85	936	-9.5	-91.8	-121.8	0.3	82.6	47.5720	35.0280	41.3450	63.8447
1.1	77.530	2.15	6.7768	51.046	-0.85	936	-9.5	-96.8	-126.8	1.3	88.6	48.4860	40.1140	41.1618	60.2250
1.1	73.047	2.15	6.4217	55.151	-1.25	936	-9.5	-88.8	-118.8	0.9	80.2	48.0185	32.1815	41.2580	61.9296
1.1	57.388	2.15	5.9685	62.003	-2.35	936	-9.5	-101.1	-131.1	-0.2	91.4	47.3828	44.0172	41.3806	64.7754
1.1	53.847	2.15	6.4267	55.086	-1.25	936	-9.5	-94.3	-124.3	0.9	85.7	48.0253	37.6747	41.2566	61.9028
1.1	61.415	2.15	7.4952	44.678	-0.45	936	-9.5	-96.3	-126.3	1.7	88.5	49.3612	39.1388	40.9674	57.5802
1.1	52.105	2.15	7.2075	46.986	-0.55	936	-9.5	-94.8	-124.8	1.6	86.9	49.0212	37.8788	41.0452	58.5387
1.1	39.775	2.15	7.1379	47.588	-0.55	936	-9.5	-96.3	-126.3	1.6	88.4	48.9369	39.4631	41.0641	58.7888
1.1	32.005	2.15	7.2645	46.506	-0.55	936	-9.5	-97	-127	1.6	89.1	49.0896	40.0104	41.0298	58.3394
1.1	45.785	2.15	8.1332	40.388	-0.35	936	-9.5	-97	-127	1.8	89.3	50.0707	39.2293	40.7946	55.7987
1.1	117.379	2.15	7.9707	41.390	-0.35	936	-9.5	-98.9	-128.9	1.8	91.2	49.8954	41.3046	40.8386	56.2146
1.1	107.952	2.15	9.4830	33.761	-0.35	936	-9.5	-99.6	-129.6	1.8	91.9	51.4045	40.4955	40.4292	53.0464
1.1	110.439	2.15	8.2354	39.786	-0.35	936	-9.5	-101.1	-131.1	1.8	93.4	50.1792	43.2208	40.7670	55.5486
1.1	105.485	2.15	7.5946	43.941	-0.35	936	-9.5	-102	-132	1.8	94.3	49.4756	44.8244	40.9405	57.2742
1.1	102.607	2.15	8.9173	36.227	-0.35	936	-9.5	-101.8	-131.8	1.8	94.1	50.8702	43.2298	40.5824	54.0706
1.1	98.639	2.15	8.3866	38.931	-0.35	936	-9.5	-98.1	-128.1	1.8	90.4	50.3373	40.0627	40.7260	55.1934
1.1	96.758	2.15	7.6963	43.215	-0.35	936	-9.5	-90.5	-120.5	1.8	82.8	49.5912	33.2088	40.9129	56.9728
1.1	92.764	2.15	7.8416	42.226	-0.35	936	-9.5	-95.7	-125.7	1.8	88	49.7537	38.2463	40.8736	56.5619
1.1	92.688	2.15	8.7922	36.827	-0.35	936	-9.5	-96.8	-126.8	1.8	89.1	50.7475	38.3525	40.6163	54.3196
1.1	90.820	2.15	9.3231	34.420	-0.35	936	-9.5	-98.8	-128.8	1.8	91.1	51.2568	39.8432	40.4725	53.3203
1.1	86.684	2.15	8.0235	41.058	-0.35	936	-9.5	-96.9	-126.9	1.8	89.2	49.9528	39.2472	40.8243	56.0767
1.1	76.348	2.15	7.5620	44.179	-0.45	936	-9.5	-89.8	-119.8	1.7	82	49.4383	32.5617	40.9493	57.3731
1.1	83.421	2.15	9.3147	34.456	-0.35	936	-9.5	-93.1	-123.1	1.8	85.4	51.2489	34.1511	40.4748	53.3350
1.1	81.948	2.15	9.8760	32.250	-0.35	936	-9.5	-91.2	-121.2	1.8	83.5	51.7571	31.7429	40.3229	52.4190
1.1	70.545	2.15	8.2868	39.491	-0.35	936	-9.5	-98.1	-128.1	1.8	90.4	50.2332	40.1668	40.7531	55.4260
1.1	83.328	2.15	8.8083	36.748	-0.35	936	-9.5	-96.9	-126.9	1.8	89.2	50.7633	38.4367	40.6119	54.2871
1.1	59.203	2.15	7.8953	41.873	-0.35	936	-9.5	-95	-125	1.8	87.3	49.8129	37.4871	40.8590	56.4155
1.1	68.787	2.15	9.5459	33.509	-0.35	936	-9.5	-100.5	-130.5	1.8	92.8	51.4618	41.3382	40.4122	52.9419
1.1	60.741	2.15	9.2575	34.699	-0.35	936	-9.5	-99.9	-129.9	1.8	92.2	51.1954	41.0046	40.4903	53.4361
1.1	68.584	2.15	10.5329	30.022	-0.45	936	-9.5	-98	-128	1.7	90.2	52.3165	37.8835	40.1450	51.4938
1.1	101.564	2.15	15.1160	20.404	-0.75	936	-9.5	-100.2	-130.2	1.4	92.1	55.4542	36.6458	38.9044	47.4993
1.1	102.840	2.15	13.8235	22.410	-0.65	936	-9.5	-101.2	-131.2	1.5	93.2	54.6779	38.5221	39.2543	48.3324
1.1	103.033	2.15	12.3951	25.161	-0.55	936	-9.5	-100.7	-130.7	1.6	92.8	53.7305	39.0695	39.6409	49.4750
1.1	102.437	2.15	11.4531	27.396	-0.55	936	-9.5	-103.1	-133.1	1.6	95.2	53.0440	42.1560	39.8959	50.4030
1.1	99.347	2.15	13.3380	23.273	-0.65	936	-9.5	-105.5	-135.5	1.5	97.5	54.3673	43.1327	39.3857	48.6908
1.1	95.322	2.15	15.5815	19.769	-0.75	936	-9.5	-101.2	-131.2	1.4	93.1	55.7177	37.3823	38.7784	47.2354
1.1	93.257	2.15	14.2144	21.762	-0.65	936	-9.5	-103.1	-133.1	1.5	95.1	54.9201	40.1799	39.1485	48.0633
1.1	92.332	2.15	11.8098	26.503	-0.55	936	-9.5	-102.7	-132.7	1.6	94.8	53.3104	41.4896	39.7994	50.0321
1.1	90.247	2.15	12.7320	24.451	-0.55	936	-9.5	-99.4	-129.4	1.6	91.5	53.9634	37.5366	39.5498	49.1801
1.1	90.644	2.15	15.1754	20.321	-0.75	936	-9.5	-100.2	-130.2	1.4	92.1	55.4883	36.6117	38.8883	47.4647
1.1	82.946	2.15	12.1911	25.612	-0.55	936	-9.5	-97.6	-127.6	1.6	89.7	53.5864	36.1136	39.6962	49.6624
1.1	82.356	2.15	14.8028	20.856	-0.75	936	-9.5	-101.8	-131.8	1.4	93.7	55.2724	38.4276	38.9892	47.6868
1.1	76.573	2.15	14.2330	21.732	-0.65	936	-9.5	-100.2	-130.2	1.5	92.2	54.9314	37.2686	39.1434	48.0508
1.1	71.065	2.15	13.0669	23.785	-0.65	936	-9.5	-97.4	-127.4	1.5	89.4	54.1890	35.2110	39.4591	48.9035
1.1	75.635	2.15	15.7032	19.609	-0.75	936	-9.5	-106.4	-136.4	1.4	98.3	55.7853	42.5147	38.7454	47.1691
1.1	66.827	2.15	12.8459	24.220	-0.55	936	-9.5	-98.5	-128.5	1.6	90.6	54.0408	36.5592	39.5189	49.0842
1.1	69.020	2.15	13.9897	22.130	-0.65	936	-9.5	-98.2	-128.2	1.5	90.2	54.7817	35.4183	39.2093	48.2160
1.1	68.576	2.15	14.7957	20.866	-0.75	936	-9.5	-100.4	-130.4	1.4	92.3	55.2682	37.0318	38.9911	47.6912
1.1	69.103	2.15	15.8450	19.427	-0.75	936	-9.5	-100.8	-130.8	1.4	92.7	55.8634	36.8366	38.7071	47.0933
1.1	70.479	2.15	17.3398	17.694	-0.75	936	-9.5	-103.4	-133.4	1.4	95.3	56.6464	38.6536	38.3024	46.3736

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

POR:	Alfredo Florián Méndez
ASESORES:	M.C. Luis Gerardo Guerrero Ojeda (UDLAP) Dr. Alejandro Aragón Zavala (ITESM Oro.)
TOMA DE MEDICIONES EN EL MUSEO "CASA DEL DEAN", PUEBLA A 936 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX	Gt(φi+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "L"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema	
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	
0.73	107.049	2.15	4.199405	20.928	-0.75	936	-9.7	-66.2	-96.2	1.4	57.9	44.3293	13.5707	20.4659	26.3554
0.73	92.09343	2.15	4.115641	21.375	-0.65	936	-9.7	-65.7	-95.7	1.5	57.5	44.1543	13.3457	20.4665	26.3206
0.73	105.3567	2.15	5.169042	16.869	-0.75	936	-9.7	-78.3	-108.3	1.4	70	46.1337	23.8663	20.4587	26.7581
0.73	97.84907	2.15	4.850959	18.012	-0.75	936	-9.7	-72	-102	1.4	63.7	45.5821	18.1179	20.4611	26.6260
0.73	87.91743	2.15	5.175413	16.848	-0.75	936	-9.7	-70	-100	1.4	61.7	46.1444	15.5556	20.4587	26.7608
0.73	103.264	2.15	5.776963	15.049	-0.85	936	-9.7	-76	-106	1.3	67.6	47.0995	20.5005	20.4543	27.0106
0.73	96.03151	2.15	5.536569	15.719	-0.85	936	-9.7	-74.6	-104.6	1.3	66.2	46.7303	19.4697	20.4560	26.9107
0.73	104.1031	2.15	6.415832	13.521	-0.85	936	-9.7	-81.4	-111.4	1.3	73	48.0106	24.9894	20.4495	27.2759
0.73	94.66307	2.15	6.330632	13.706	-0.85	936	-9.7	-70.3	-100.3	1.3	61.9	47.8945	14.0055	20.4502	27.2405
0.73	88.20714	2.15	6.255478	13.874	-0.85	936	-9.7	-74.9	-104.9	1.3	66.5	47.7907	18.7093	20.4507	27.2093
0.73	102.1004	2.15	7.264475	11.916	-0.75	936	-9.7	-82.3	-112.3	1.4	74	49.0896	24.9104	20.4432	27.6283
0.73	95.84326	2.15	7.037443	12.307	-0.85	936	-9.7	-76.2	-106.2	1.3	67.8	48.8138	18.9862	20.4449	27.5341
0.73	90	2.15	7.27629	11.897	-0.75	936	-9.7	-77.9	-107.9	1.4	69.6	49.1037	20.4963	20.4432	27.6333
0.73	97.40842	2.15	7.670887	11.277	-0.75	936	-9.7	-75	-105	1.4	66.7	49.5624	17.1376	20.4402	27.7971
0.73	100.5309	2.15	8.074187	10.706	-0.75	936	-9.7	-70.6	-100.6	1.4	62.3	50.0075	12.2925	20.4373	27.9646
0.73	91.24856	2.15	7.94474	10.883	-0.75	936	-9.7	-74.2	-104.2	1.4	65.9	49.8671	16.0329	20.4382	27.9109
0.73	95.01558	2.15	8.258462	10.465	-0.75	936	-9.7	-78.3	-108.3	1.4	70	50.2035	19.7965	20.4359	28.0411
0.73	98.44883	2.15	8.772993	9.845	-0.75	936	-9.7	-76.2	-106.2	1.4	67.9	50.7285	17.1715	20.4321	28.2548
0.73	91.75203	2.15	8.635253	10.003	-0.75	936	-9.7	-74.5	-104.5	1.4	66.2	50.5910	15.6090	20.4331	28.1976
0.73	87.25022	2.15	8.266589	10.454	-0.75	936	-9.7	-74.2	-104.2	1.4	65.9	50.2120	15.6880	20.4358	28.0445
0.73	95.38201	2.15	8.975244	9.621	-0.75	936	-9.7	-72.9	-102.9	1.4	64.6	50.9264	13.6736	20.4306	28.3388
0.73	99.46232	2.15	9.246621	9.336	-0.75	936	-9.7	-76.1	-106.1	1.4	67.8	51.1852	16.6148	20.4286	28.4515
0.73	92.96637	2.15	9.205205	9.378	-0.75	936	-9.7	-72.6	-102.6	1.4	64.3	51.1462	13.1538	20.4289	28.4343
0.73	88.33346	2.15	9.404323	9.178	-0.75	936	-9.7	-77.3	-107.3	1.4	69	51.3321	17.6679	20.4274	28.5170
0.73	95.55627	2.15	9.721548	8.876	-0.75	936	-9.7	-73.8	-103.8	1.4	65.5	51.6202	13.8798	20.4251	28.6488
0.73	91.72132	2.15	9.770189	8.831	-0.75	936	-9.7	-81	-111	1.4	72.7	51.6636	21.0364	20.4247	28.6690
0.73	98.51365	2.15	10.04208	8.591	-0.75	936	-9.7	-74.5	-104.5	1.4	66.2	51.9020	14.2980	20.4227	28.7819
0.73	96.38917	2.15	10.44248	8.259	-0.75	936	-9.7	-74.6	-104.6	1.4	66.3	52.2416	14.0584	20.4197	28.9482
0.73	93.71529	2.15	10.14261	8.505	-0.75	936	-9.7	-78.8	-108.8	1.4	70.5	51.9885	18.5115	20.4219	28.8236
0.73	89.15748	2.15	10.3108	8.365	-0.75	936	-9.7	-76.3	-106.3	1.4	68	52.1314	15.8686	20.4207	28.8935
0.73	98.13775	2.15	10.70234	8.057	-0.75	936	-9.7	-79.3	-109.3	1.4	71	52.4551	18.5449	20.4178	29.0561
0.73	92.77022	2.15	10.65841	8.090	-0.75	936	-9.7	-80.9	-110.9	1.4	72.6	52.4194	20.1806	20.4181	29.0378
0.73	89.56012	2.15	10.52772	8.191	-0.75	936	-9.7	-82	-112	1.4	73.7	52.3122	21.3878	20.4191	28.9836
0.73	96.5153	2.15	10.9433	7.878	-0.75	936	-9.7	-78.9	-108.9	1.4	70.6	52.6485	17.9515	20.4160	29.1562
0.73	94.41092	2.15	10.89571	7.913	-0.75	936	-9.7	-79.4	-109.4	1.4	71.1	52.6106	18.4894	20.4164	29.1364
0.73	88.6764	2.15	10.92634	7.891	-0.75	936	-9.7	-80.1	-110.1	1.4	71.8	52.6350	19.1650	20.4161	29.1491
0.73	98.60181	2.15	11.2659	7.651	-0.75	936	-9.7	-80.7	-110.7	1.4	72.4	52.9008	19.4992	20.4136	29.2901
0.73	95.30621	2.15	11.23828	7.670	-0.75	936	-9.7	-81.7	-111.7	1.4	73.4	52.8795	20.5205	20.4138	29.2787
0.73	92.07503	2.15	11.14861	7.732	-0.75	936	-9.7	-84.3	-114.3	1.4	76	52.8099	23.1901	20.4145	29.2414
0.73	89.27214	2.15	11.1225	7.751	-0.75	936	-9.7	-86.5	-116.5	1.4	78.2	52.7896	25.4104	20.4147	29.2306
0.73	130.02	2.15	5.346485	16.294	-0.75	936	-9.7	-76.4	-106.4	1.4	68.1	46.4269	21.6731	20.4574	26.8318
0.73	123.6191	2.15	4.723696	18.515	-0.75	936	-9.7	-71.6	-101.6	1.4	63.3	45.3512	17.9488	20.4620	26.5732
0.73	118.9166	2.15	4.30272	20.403	-0.75	936	-9.7	-76.8	-106.8	1.4	68.5	44.5404	23.9596	20.4652	26.3983
0.73	123.1307	2.15	5.602044	15.531	-0.85	936	-9.7	-72.4	-102.4	1.3	64	46.8324	17.1676	20.4555	26.9379
0.73	121.086	2.15	5.050446	17.278	-0.75	936	-9.7	-75.5	-105.5	1.4	67.2	45.9321	21.2679	20.4596	26.7089
0.73	115.2806	2.15	5.208359	16.738	-0.75	936	-9.7	-74.6	-104.6	1.4	66.3	46.1995	20.1005	20.4585	26.7744
0.73	122.7236	2.15	6.106587	14.219	-0.85	936	-9.7	-73.7	-103.7	1.3	65.3	47.5815	17.7185	20.4518	27.1475
0.73	115.85	2.15	5.926685	14.661	-0.85	936	-9.7	-74.1	-104.1	1.3	65.7	47.3218	18.3782	20.4531	27.0728
0.73	119.0191	2.15	6.443757	13.461	-0.85	936	-9.7	-72.9	-102.9	1.3	64.5	48.0483	16.4517	20.4493	27.2875
0.73	111.962	2.15	6.148479	14.121	-0.85	936	-9.7	-75.9	-105.9	1.3	67.5	47.6409	19.8591	20.4515	27.1649

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TOMA DE MEDICIONES EN EL MUSEO "CASA DEL DEAN", PUEBLA A 936 MHZ	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX		Gt(φ+θ)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Li"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec De Regresión del Sistema	
							dBm	dB							
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ		dB	dB	dB	dB	dB	dB	dB	
0.73	111.962	2.15	6.148479	14.121	-0.85	936	-9.7	-75.9	-105.9	1.3	67.5	47.6409	19.8591	20.4515	27.1649
0.73	118.8633	2.15	6.857295	12.635	-0.85	936	-9.7	-74.2	-104.2	1.3	65.8	48.5886	17.2114	20.4463	27.4592
0.73	112.2564	2.15	6.71744	12.903	-0.85	936	-9.7	-75.4	-105.4	1.3	67	48.4096	18.5904	20.4473	27.4012
0.73	116.6375	2.15	7.227814	11.978	-0.75	936	-9.7	-76.4	-106.4	1.4	68.1	49.0457	19.0543	20.4435	27.6131
0.73	113.8952	2.15	7.073358	12.243	-0.85	936	-9.7	-76	-106	1.3	67.6	48.8580	18.7420	20.4447	27.5490
0.73	113.8683	2.15	7.564285	11.438	-0.75	936	-9.7	-75.7	-105.7	1.4	67.4	49.4409	17.9591	20.4410	27.7529
0.73	110.4838	2.15	7.579683	11.414	-0.75	936	-9.7	-76.7	-106.7	1.4	68.4	49.4585	18.9415	20.4409	27.7593
0.73	111.5855	2.15	8.024269	10.774	-0.75	936	-9.7	-77.9	-107.9	1.4	69.6	49.9536	19.6464	20.4376	27.9439
0.73	106.1387	2.15	7.878921	10.975	-0.75	936	-9.7	-78.3	-108.3	1.4	70	49.7949	20.2051	20.4387	27.8835
0.73	111.8144	2.15	8.343674	10.357	-0.75	936	-9.7	-78.2	-108.2	1.4	69.9	50.2927	19.6073	20.4353	28.0765
0.73	107.7877	2.15	8.255501	10.469	-0.75	936	-9.7	-79.9	-109.9	1.4	71.6	50.2004	21.3996	20.4359	28.0399
0.73	114.4071	2.15	7.864286	10.996	-0.75	936	-9.7	-80.6	-110.6	1.4	72.3	49.7787	22.5213	20.4388	27.8774
0.73	110.1387	2.15	7.699227	11.234	-0.75	936	-9.7	-81.4	-111.4	1.4	73.1	49.5945	23.5055	20.4400	27.8089
0.73	106.06	2.15	7.702318	11.230	-0.75	936	-9.7	-82.1	-112.1	1.4	73.8	49.5979	24.2021	20.4400	27.8102
0.73	111.8949	2.15	8.104505	10.666	-0.75	936	-9.7	-82.5	-112.5	1.4	74.2	50.0400	24.1600	20.4370	27.9772
0.73	108.5942	2.15	8.105807	10.664	-0.75	936	-9.7	-81.6	-111.6	1.4	73.3	50.0414	23.2586	20.4370	27.9778
0.73	112.127	2.15	8.627103	10.013	-0.75	936	-9.7	-81.7	-111.7	1.4	73.4	50.5828	22.8172	20.4332	28.1942
0.73	108.7574	2.15	8.560053	10.092	-0.75	936	-9.7	-84.4	-114.4	1.4	76.1	50.5150	25.5850	20.4337	28.1664
0.73	104.8185	2.15	8.308315	10.401	-0.75	936	-9.7	-84.8	-114.8	1.4	76.5	50.2558	26.2442	20.4355	28.0619
0.73	110.8772	2.15	9.103961	9.483	-0.75	936	-9.7	-84	-114	1.4	75.7	51.0501	24.6499	20.4296	28.3923
0.73	104.9871	2.15	8.752817	9.868	-0.75	936	-9.7	-83.7	-113.7	1.4	75.4	50.7085	24.6915	20.4322	28.2465
0.73	110.0524	2.15	9.308566	9.273	-0.75	936	-9.7	-83.4	-113.4	1.4	75.1	51.2432	23.8568	20.4281	28.4773
0.73	107.4592	2.15	9.222001	9.361	-0.75	936	-9.7	-83.3	-113.3	1.4	75	51.1620	23.8380	20.4288	28.4413
0.73	108.5506	2.15	9.517258	9.068	-0.75	936	-9.7	-83.9	-113.9	1.4	75.6	51.4358	24.1642	20.4266	28.5639
0.73	104.9275	2.15	9.475215	9.109	-0.75	936	-9.7	-85	-115	1.4	76.7	51.3973	25.3027	20.4269	28.5465
0.73	108.9262	2.15	10.07071	8.566	-0.75	936	-9.7	-84.8	-114.8	1.4	76.5	51.9267	24.5733	20.4225	28.7938
0.73	104.9314	2.15	9.74117	8.858	-0.75	936	-9.7	-85.2	-115.2	1.4	76.9	51.6377	25.2623	20.4249	28.6569
0.73	104.051	2.15	9.510021	9.075	-0.75	936	-9.7	-83.3	-113.3	1.4	75	51.4291	23.5709	20.4266	28.5609
0.73	107.3705	2.15	10.49133	8.220	-0.75	936	-9.7	-84.8	-114.8	1.4	76.5	52.2821	24.2179	20.4194	28.9685
0.73	105.4391	2.15	10.21537	8.444	-0.75	936	-9.7	-85.9	-115.9	1.4	77.6	52.0506	25.5494	20.4214	28.8539
0.73	103.4415	2.15	10.39048	8.300	-0.75	936	-9.7	-86.3	-116.3	1.4	78	52.1982	25.8018	20.4201	28.9266
0.73	144.5038	2.15	6.596651	13.143	-0.85	936	-9.7	-76.1	-106.1	1.3	67.7	48.2520	19.4480	20.4482	27.3510
0.73	137.9855	2.15	6.422772	13.506	-0.85	936	-9.7	-76.4	-106.4	1.3	68	48.0200	19.9800	20.4495	27.2788
0.73	134.1657	2.15	6.017142	14.435	-0.85	936	-9.7	-75.7	-105.7	1.3	67.3	47.4533	19.8467	20.4525	27.1103
0.73	137.1462	2.15	7.330211	11.808	-0.75	936	-9.7	-77.9	-107.9	1.4	69.6	49.1678	20.4322	20.4428	27.6556
0.73	130.3813	2.15	6.669078	12.998	-0.85	936	-9.7	-77.2	-107.2	1.3	68.8	48.3468	20.4532	20.4476	27.3811
0.73	130.749	2.15	7.309945	11.841	-0.75	936	-9.7	-79.3	-109.3	1.4	71	49.1438	21.8562	20.4429	27.6472
0.73	129.5254	2.15	7.99835	10.809	-0.75	936	-9.7	-80.9	-110.9	1.4	72.6	49.9255	22.6745	20.4378	27.9331
0.73	125.1342	2.15	8.064366	10.720	-0.75	936	-9.7	-76.2	-106.2	1.4	67.9	49.9969	17.9031	20.4373	27.9605
0.73	122.5285	2.15	7.807432	11.077	-0.75	936	-9.7	-81.5	-111.5	1.4	73.2	49.7157	23.4843	20.4392	27.8538
0.73	125.8731	2.15	8.865145	9.741	-0.75	936	-9.7	-79.6	-109.6	1.4	71.3	50.8192	20.4808	20.4314	28.2931
0.73	121.6191	2.15	9.861648	8.749	-0.75	936	-9.7	-82.1	-112.1	1.4	73.8	51.7445	22.0555	20.4240	28.7070
0.73	117.8581	2.15	9.239113	9.344	-0.75	936	-9.7	-82	-112	1.4	73.7	51.1781	22.5219	20.4286	28.4484
0.73	114.4589	2.15	9.609605	8.980	-0.75	936	-9.7	-83.1	-113.1	1.4	74.8	51.5196	23.2804	20.4259	28.6023
0.73	119.1114	2.15	10.87454	7.928	-0.75	936	-9.7	-82.4	-112.4	1.4	74.1	52.5937	21.5063	20.4165	29.1276
0.73	116.0636	2.15	10.32872	8.350	-0.75	936	-9.7	-82.9	-112.9	1.4	74.6	52.1464	22.4536	20.4206	28.9009
0.73	116.5876	2.15	11.47114	7.514	-0.75	936	-9.7	-83.4	-113.4	1.4	75.1	53.0576	22.0424	20.4121	29.3754
0.73	112.383	2.15	10.8969	7.912	-0.75	936	-9.7	-84.5	-114.5	1.4	76.2	52.6116	23.5884	20.4164	29.1369
0.73	114.0699	2.15	12.01016	7.175	-0.75	936	-9.7	-83.8	-113.8	1.4	75.5	53.4565	22.0435	20.4081	29.5992
0.73	111.3786	2.15	11.67334	7.383	-0.75	936	-9.7	-85.1	-115.1	1.4	76.8	53.2094	23.5906	20.4106	29.4593
0.73	109.0721	2.15	11.75613	7.331	-0.75	936	-9.7	-86.7	-116.7	1.4	78.4	53.2708	25.1292	20.4100	29.4937

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

POR:	Alfredo Florián Méndez
ASESORES:	M.C. Luis Gerardo Guerrero Ojeda (UDLAP) Dr. Alejandro Aragón Zavala (ITESM Oro.)
TOMA DE MEDICIONES EN EL MUSEO "CASA DEL DEAN", PUEBLA A 959 MHZ	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX	Gt(φi+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "L"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema	
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	
0.73	107.049	2.15	4.1994	20.928	-0.75	959	-7.6	-61.7	-91.7	1.4	55.5	44.5401	10.9599	20.6177	24.3958
0.73	92.09343	2.15	4.1156	21.375	-0.65	959	-7.6	-60.2	-90.2	1.5	54.1	44.3651	9.7349	20.6183	24.3610
0.73	105.3567	2.15	5.1690	16.869	-0.75	959	-7.6	-70.2	-100.2	1.4	64	46.3446	17.6554	20.6105	24.7985
0.73	97.84907	2.15	4.8510	18.012	-0.75	959	-7.6	-68	-98	1.4	61.8	45.7929	16.0071	20.6129	24.6664
0.73	87.91743	2.15	5.1754	16.848	-0.75	959	-7.6	-73.1	-103.1	1.4	66.9	46.3553	20.5447	20.6105	24.8012
0.73	103.264	2.15	5.7770	15.049	-0.85	959	-7.6	-70.7	-100.7	1.3	64.4	47.3104	17.0896	20.6061	25.0510
0.73	96.03151	2.15	5.5366	15.719	-0.85	959	-7.6	-73.1	-103.1	1.3	66.8	46.9412	19.8588	20.6078	24.9511
0.73	104.1031	2.15	6.4158	13.521	-0.85	959	-7.6	-73.4	-103.4	1.3	67.1	48.2214	18.8786	20.6013	25.3163
0.73	94.66307	2.15	6.3306	13.706	-0.85	959	-7.6	-76.4	-106.4	1.3	70.1	48.1053	21.9947	20.6020	25.2809
0.73	88.20714	2.15	6.2555	13.874	-0.85	959	-7.6	-68.5	-98.5	1.3	62.2	48.0016	14.1984	20.6025	25.2497
0.73	102.1004	2.15	7.2645	11.916	-0.75	959	-7.6	-74	-104	1.4	67.8	49.3005	18.4995	20.5950	25.6687
0.73	95.84326	2.15	7.0374	12.307	-0.85	959	-7.6	-71.9	-101.9	1.3	65.6	49.0247	16.5753	20.5967	25.5745
0.73	90	2.15	7.2763	11.897	-0.75	959	-7.6	-66.5	-96.5	1.4	60.3	49.3146	10.9854	20.5950	25.6737
0.73	97.40842	2.15	7.6709	11.277	-0.75	959	-7.6	-71.6	-101.6	1.4	65.4	49.7733	15.6267	20.5920	25.8375
0.73	100.5309	2.15	8.0742	10.706	-0.75	959	-7.6	-71.8	-101.8	1.4	65.6	50.2183	15.3817	20.5891	26.0050
0.73	91.24856	2.15	7.9447	10.883	-0.75	959	-7.6	-64.9	-94.9	1.4	58.7	50.0780	8.6220	20.5900	25.9513
0.73	95.01558	2.15	8.2585	10.465	-0.75	959	-7.6	-74.6	-104.6	1.4	68.4	50.4144	17.9856	20.5877	26.0815
0.73	98.44883	2.15	8.7730	9.845	-0.75	959	-7.6	-68.7	-98.7	1.4	62.5	50.9393	11.5607	20.5839	26.2952
0.73	91.75203	2.15	8.6353	10.003	-0.75	959	-7.6	-72.3	-102.3	1.4	66.1	50.8019	15.2981	20.5849	26.2380
0.73	87.25022	2.15	8.2666	10.454	-0.75	959	-7.6	-73	-103	1.4	66.8	50.4229	16.3771	20.5876	26.0849
0.73	95.38201	2.15	8.9752	9.621	-0.75	959	-7.6	-72.8	-102.8	1.4	66.6	51.1373	15.4627	20.5824	26.3792
0.73	99.46232	2.15	9.2466	9.336	-0.75	959	-7.6	-77.6	-107.6	1.4	71.4	51.3960	20.0040	20.5804	26.4919
0.73	92.96637	2.15	9.2052	9.378	-0.75	959	-7.6	-73	-103	1.4	66.8	51.3570	15.4430	20.5807	26.4747
0.73	88.33346	2.15	9.4043	9.178	-0.75	959	-7.6	-75.6	-105.6	1.4	69.4	51.5429	17.8571	20.5792	26.5574
0.73	95.55627	2.15	9.7215	8.876	-0.75	959	-7.6	-76.5	-106.5	1.4	70.3	51.8311	18.4689	20.5769	26.6892
0.73	91.72132	2.15	9.7702	8.831	-0.75	959	-7.6	-75.2	-105.2	1.4	69	51.8744	17.1256	20.5765	26.7094
0.73	98.51365	2.15	10.0421	8.591	-0.75	959	-7.6	-75.2	-105.2	1.4	69	52.1128	16.8872	20.5745	26.8223
0.73	96.38917	2.15	10.4425	8.259	-0.75	959	-7.6	-76.3	-106.3	1.4	70.1	52.4524	17.6476	20.5715	26.9886
0.73	93.71529	2.15	10.1426	8.505	-0.75	959	-7.6	-76.1	-106.1	1.4	69.9	52.1994	17.7006	20.5737	26.8640
0.73	89.15748	2.15	10.3108	8.365	-0.75	959	-7.6	-76	-106	1.4	69.8	52.3422	17.4578	20.5725	26.9339
0.73	98.13775	2.15	10.7023	8.057	-0.75	959	-7.6	-78.9	-108.9	1.4	72.7	52.6659	20.0341	20.5696	27.0965
0.73	92.77022	2.15	10.6584	8.090	-0.75	959	-7.6	-75.8	-105.8	1.4	69.6	52.6302	16.9698	20.5699	27.0782
0.73	89.56012	2.15	10.5277	8.191	-0.75	959	-7.6	-76.7	-106.7	1.4	70.5	52.5231	17.9769	20.5709	27.0240
0.73	96.5153	2.15	10.9433	7.878	-0.75	959	-7.6	-78.1	-108.1	1.4	71.9	52.8593	19.0407	20.5678	27.1966
0.73	94.41092	2.15	10.8957	7.913	-0.75	959	-7.6	-85.6	-115.6	1.4	79.4	52.8215	26.5785	20.5682	27.1768
0.73	88.6764	2.15	10.9263	7.891	-0.75	959	-7.6	-82.7	-112.7	1.4	76.5	52.8459	23.6541	20.5679	27.1895
0.73	98.60181	2.15	11.2659	7.651	-0.75	959	-7.6	-81.2	-111.2	1.4	75	53.1117	21.8883	20.5654	27.3305
0.73	95.30621	2.15	11.2383	7.670	-0.75	959	-7.6	-84.9	-114.9	1.4	78.7	53.0904	25.6096	20.5656	27.3191
0.73	92.07503	2.15	11.1486	7.732	-0.75	959	-7.6	-78.5	-108.5	1.4	72.3	53.0208	19.2792	20.5663	27.2818
0.73	89.27214	2.15	11.1225	7.751	-0.75	959	-7.6	-84.2	-114.2	1.4	78	53.0004	24.9996	20.5665	27.2710
0.73	130.02	2.15	5.3465	16.294	-0.75	959	-7.6	-76.1	-106.1	1.4	69.9	46.6377	23.2623	20.6092	24.8722
0.73	123.6191	2.15	4.7237	18.515	-0.75	959	-7.6	-73.1	-103.1	1.4	66.9	45.5620	21.3380	20.6138	24.6136
0.73	118.9166	2.15	4.3027	20.403	-0.75	959	-7.6	-73.6	-103.6	1.4	67.4	44.7512	22.6488	20.6170	24.4387
0.73	123.1307	2.15	5.6020	15.531	-0.85	959	-7.6	-71.6	-101.6	1.3	65.3	47.0433	18.2567	20.6073	24.9783
0.73	121.086	2.15	5.0504	17.278	-0.75	959	-7.6	-77.2	-107.2	1.4	71	46.1430	24.8570	20.6114	24.7493
0.73	115.2806	2.15	5.2084	16.738	-0.75	959	-7.6	-74.9	-104.9	1.4	68.7	46.4104	22.2896	20.6103	24.8148
0.73	122.7236	2.15	6.1066	14.219	-0.85	959	-7.6	-71.6	-101.6	1.3	65.3	47.7923	17.5077	20.6036	25.1879
0.73	115.85	2.15	5.9267	14.661	-0.85	959	-7.6	-73.6	-103.6	1.3	67.3	47.5326	19.7674	20.6049	25.1132
0.73	119.0191	2.15	6.4438	13.461	-0.85	959	-7.6	-74.3	-104.3	1.3	68	48.2592	19.7408	20.6011	25.3279
0.73	111.962	2.15	6.1485	14.121	-0.85	959	-7.6	-74.8	-104.8	1.3	68.5	47.8517	20.6483	20.6033	25.2053

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TOMA DE MEDICIONES EN EL MUSEO "CASA DEL DEAN", PUEBLA A 959 MHZ	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX			Gt(φ+θ)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Li"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec De Regresión del Sistema
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB	dB
0.73	118.8633	2.15	6.8573	12.635	-0.85	959	-7.6	-72.8	-102.8	1.3	66.5	48.7994	17.7006	20.5981	25.4996	
0.73	112.2564	2.15	6.7174	12.903	-0.85	959	-7.6	-72.8	-102.8	1.3	66.5	48.6204	17.8796	20.5991	25.4416	
0.73	116.6375	2.15	7.2278	11.978	-0.75	959	-7.6	-75.8	-105.8	1.4	69.6	49.2565	20.3435	20.5953	25.6535	
0.73	113.8952	2.15	7.0734	12.243	-0.85	959	-7.6	-74.3	-104.3	1.3	68	49.0689	18.9311	20.5965	25.5894	
0.73	113.8683	2.15	7.5643	11.438	-0.75	959	-7.6	-76.4	-106.4	1.4	70.2	49.6517	20.5483	20.5928	25.7933	
0.73	110.4838	2.15	7.5797	11.414	-0.75	959	-7.6	-77.4	-107.4	1.4	71.2	49.6694	21.5306	20.5927	25.7997	
0.73	111.5855	2.15	8.0243	10.774	-0.75	959	-7.6	-77.8	-107.8	1.4	71.6	50.1645	21.4355	20.5894	25.9843	
0.73	106.1387	2.15	7.8789	10.975	-0.75	959	-7.6	-78	-108	1.4	71.8	50.0057	21.7943	20.5905	25.9239	
0.73	111.8144	2.15	8.3437	10.357	-0.75	959	-7.6	-77.3	-107.3	1.4	71.1	50.5035	20.5965	20.5871	26.1169	
0.73	107.7877	2.15	8.2555	10.469	-0.75	959	-7.6	-80.6	-110.6	1.4	74.4	50.4112	23.9888	20.5877	26.0803	
0.73	114.4071	2.15	7.8643	10.996	-0.75	959	-7.6	-81.2	-111.2	1.4	75	49.9896	25.0104	20.5906	25.9178	
0.73	110.1387	2.15	7.6992	11.234	-0.75	959	-7.6	-80.6	-110.6	1.4	74.4	49.8053	24.5947	20.5918	25.8493	
0.73	106.06	2.15	7.7023	11.230	-0.75	959	-7.6	-81	-111	1.4	74.8	49.8088	24.9912	20.5918	25.8506	
0.73	111.8949	2.15	8.1045	10.666	-0.75	959	-7.6	-82.5	-112.5	1.4	76.3	50.2509	26.0491	20.5888	26.0176	
0.73	108.5942	2.15	8.1058	10.664	-0.75	959	-7.6	-82.9	-112.9	1.4	76.7	50.2523	26.4477	20.5888	26.0182	
0.73	112.127	2.15	8.6271	10.013	-0.75	959	-7.6	-84.6	-114.6	1.4	78.4	50.7937	27.6063	20.5850	26.2346	
0.73	108.7574	2.15	8.5601	10.092	-0.75	959	-7.6	-88.4	-118.4	1.4	82.2	50.7259	31.4741	20.5855	26.2068	
0.73	104.8185	2.15	8.3083	10.401	-0.75	959	-7.6	-81.8	-111.8	1.4	75.6	50.4666	25.1334	20.5873	26.1023	
0.73	110.8772	2.15	9.1040	9.483	-0.75	959	-7.6	-81.7	-111.7	1.4	75.5	51.2610	24.2390	20.5814	26.4327	
0.73	104.9871	2.15	8.7528	9.868	-0.75	959	-7.6	-83.7	-113.7	1.4	77.5	50.9193	26.5807	20.5840	26.2869	
0.73	110.0524	2.15	9.3086	9.273	-0.75	959	-7.6	-81.3	-111.3	1.4	75.1	51.4540	23.6460	20.5799	26.5177	
0.73	107.4592	2.15	9.2220	9.361	-0.75	959	-7.6	-82.7	-112.7	1.4	76.5	51.3729	25.1271	20.5806	26.4817	
0.73	108.5506	2.15	9.5173	9.068	-0.75	959	-7.6	-82.1	-112.1	1.4	75.9	51.6466	24.2534	20.5784	26.6043	
0.73	104.9275	2.15	9.4752	9.109	-0.75	959	-7.6	-82.9	-112.9	1.4	76.7	51.6082	25.0918	20.5787	26.5869	
0.73	108.9262	2.15	10.0707	8.566	-0.75	959	-7.6	-83.2	-113.2	1.4	77	52.1376	24.8624	20.5743	26.8342	
0.73	104.9314	2.15	9.7412	8.858	-0.75	959	-7.6	-82.9	-112.9	1.4	76.7	51.8486	24.8514	20.5767	26.6973	
0.73	104.051	2.15	9.5100	9.075	-0.75	959	-7.6	-84.9	-114.9	1.4	78.7	51.6400	27.0600	20.5784	26.6013	
0.73	107.3705	2.15	10.4913	8.220	-0.75	959	-7.6	-84.6	-114.6	1.4	78.4	52.4930	25.9070	20.5712	27.0089	
0.73	105.4391	2.15	10.2154	8.444	-0.75	959	-7.6	-85.1	-115.1	1.4	78.9	52.2615	26.6385	20.5732	26.8943	
0.73	103.4415	2.15	10.3905	8.300	-0.75	959	-7.6	-85.2	-115.2	1.4	79	52.4091	26.5909	20.5719	26.9670	
0.73	144.5038	2.15	6.5967	13.143	-0.85	959	-7.6	-71.6	-101.6	1.3	65.3	48.4628	16.8372	20.6000	25.3914	
0.73	137.9855	2.15	6.4228	13.506	-0.85	959	-7.6	-73.2	-103.2	1.3	66.9	48.2308	18.6692	20.6013	25.3192	
0.73	134.1657	2.15	6.0171	14.435	-0.85	959	-7.6	-75.9	-105.9	1.3	69.6	47.6642	21.9358	20.6043	25.1507	
0.73	137.1462	2.15	7.3302	11.808	-0.75	959	-7.6	-76.3	-106.3	1.4	70.1	49.3787	20.7213	20.5946	25.6960	
0.73	130.3813	2.15	6.6691	12.998	-0.85	959	-7.6	-73.9	-103.9	1.3	67.6	48.5577	19.0423	20.5994	25.4215	
0.73	130.749	2.15	7.3099	11.841	-0.75	959	-7.6	-73.9	-103.9	1.4	67.7	49.3547	18.3453	20.5947	25.6876	
0.73	129.5254	2.15	7.9983	10.809	-0.75	959	-7.6	-76.1	-106.1	1.4	69.9	50.1364	19.7636	20.5896	25.9735	
0.73	125.1342	2.15	8.0644	10.720	-0.75	959	-7.6	-77.9	-107.9	1.4	71.7	50.2078	21.4922	20.5891	26.0009	
0.73	122.5285	2.15	7.8074	11.077	-0.75	959	-7.6	-80	-110	1.4	73.8	49.9265	23.8735	20.5910	25.8942	
0.73	125.8731	2.15	8.8651	9.741	-0.75	959	-7.6	-79.9	-109.9	1.4	73.7	51.0301	22.6699	20.5832	26.3335	
0.73	121.6191	2.15	9.8616	8.749	-0.75	959	-7.6	-79.9	-109.9	1.4	73.7	51.9554	21.7446	20.5758	26.7474	
0.73	117.8581	2.15	9.2391	9.344	-0.75	959	-7.6	-79.3	-109.3	1.4	73.1	51.3890	21.7110	20.5804	26.4888	
0.73	114.4589	2.15	9.6096	8.980	-0.75	959	-7.6	-81.6	-111.6	1.4	75.4	51.7305	23.6695	20.5777	26.6427	
0.73	119.1114	2.15	10.8745	7.928	-0.75	959	-7.6	-80	-110	1.4	73.8	52.8046	20.9954	20.5683	27.1680	
0.73	116.0636	2.15	10.3287	8.350	-0.75	959	-7.6	-80.9	-110.9	1.4	74.7	52.3573	22.3427	20.5724	26.9413	
0.73	116.5876	2.15	11.4711	7.514	-0.75	959	-7.6	-83	-113	1.4	76.8	53.2685	23.5315	20.5639	27.4158	
0.73	112.383	2.15	10.8969	7.912	-0.75	959	-7.6	-85.2	-115.2	1.4	79	52.8224	26.1776	20.5682	27.1773	
0.73	114.0699	2.15	12.0102	7.175	-0.75	959	-7.6	-82.7	-112.7	1.4	76.5	53.6673	22.8327	20.5599	27.6396	
0.73	111.3786	2.15	11.6733	7.383	-0.75	959	-7.6	-85.4	-115.4	1.4	79.2	53.4203	25.7797	20.5624	27.4997	
0.73	109.0721	2.15	11.7561	7.331	-0.75	959	-7.6	-88.9	-118.9	1.4	82.7	53.4817	29.2183	20.5618	27.5341	

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

POR:	Alfredo Florian Méndez
ASESORES:	M.C. Luis Gerardo Guerrero Ojeda (UDLAP)
	Dr. Alejandro Aragón Zavala (ITESM Qro.)
TOMA DE MEDICIONES EN EL EX CONVENTO DE TECAMACHALCO, PUEBLA A 936 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX	Gt(φi+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Li"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema	
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	
1	154.6366	2.15	8.031893	10.763	-0.75	936	-9.3	-104.1	-134.1	1.4	96.2	49.9619	46.2381	43.8682	38.4654
1	145.3899	2.15	6.56464	13.209	-0.85	936	-9.3	-106.9	-136.9	1.3	98.9	48.2097	50.6903	43.8790	37.8561
1	142.8618	2.15	8.253539	10.471	-0.75	936	-9.3	-104.3	-134.3	1.4	96.4	50.1983	46.2017	43.8665	38.5575
1	136.1446	2.15	6.891161	12.572	-0.85	936	-9.3	-102.5	-132.5	1.3	94.5	48.6314	45.8686	43.8766	37.9917
1	138.426	2.15	9.700954	8.895	-0.75	936	-9.3	-103.4	-133.4	1.4	95.5	51.6018	43.8982	43.8558	39.1586
1	133.0942	2.15	8.217688	10.517	-0.75	936	-9.3	-106.4	-136.4	1.4	98.5	50.1605	48.3395	43.8668	38.5426
1	133.0508	2.15	9.885267	8.728	-0.75	936	-9.3	-109	-139	1.4	101.1	51.7653	49.3347	43.8544	39.2352
1	127.1829	2.15	8.913254	9.688	-0.75	936	-9.3	-102.2	-132.2	1.4	94.3	50.8662	43.4338	43.8616	38.8315
1	132.4078	2.15	10.73692	8.031	-0.75	936	-9.3	-103.4	-133.4	1.4	95.5	52.4831	43.0169	43.8481	39.5888
1	135.8961	2.15	6.945884	12.472	-0.85	936	-9.3	-105.6	-135.6	1.3	97.6	48.7001	48.8999	43.8762	38.0144
1	141.8182	2.15	5.451789	15.970	-0.85	936	-9.3	-99.3	-129.3	1.3	91.3	46.5963	44.7037	43.8873	37.3939
1	114.318	2.15	4.051839	21.728	-0.65	936	-9.3	-97.6	-127.6	1.5	89.8	44.0186	45.7814	43.8976	36.8125
1	128.7669	2.15	5.234281	16.653	-0.75	936	-9.3	-100.3	-130.3	1.4	92.4	46.2427	46.1573	43.8889	37.3036
1	130.6533	2.15	6.156541	14.102	-0.85	936	-9.3	-92.8	-122.8	1.3	84.8	47.6523	37.1477	43.8820	37.6866
1	113.1436	2.15	5.67216	15.334	-0.85	936	-9.3	-96.8	-126.8	1.3	88.8	46.9405	41.8595	43.8856	37.4854
1	116.9958	2.15	6.13433	14.154	-0.85	936	-9.3	-99.8	-129.8	1.3	91.8	47.6209	44.1791	43.8822	37.6774
1	115.5662	2.15	7.338283	11.795	-0.75	936	-9.3	-97.7	-127.7	1.4	89.8	49.1774	40.6226	43.8733	38.1774
1	107.0281	2.15	7.493524	11.547	-0.75	936	-9.3	-91.5	-121.5	1.4	83.6	49.3592	34.2408	43.8721	38.2419
1	114.9136	2.15	8.512984	10.149	-0.75	936	-9.3	-102.2	-132.2	1.4	94.3	50.4672	43.8328	43.8646	38.6652
1	109.6396	2.15	8.259867	10.463	-0.75	936	-9.3	-95.8	-125.8	1.4	87.9	50.2050	37.6950	43.8665	38.5601
1	132.6204	2.15	10.66515	8.085	-0.75	936	-9.3	-110.1	-140.1	1.4	102.2	52.4249	49.7751	43.8487	39.5590
1	125.2781	2.15	10.11965	8.524	-0.75	936	-9.3	-106.9	-136.9	1.4	99	51.9688	47.0312	43.8527	39.3325
1	119.6756	2.15	9.351754	9.230	-0.75	936	-9.3	-101.8	-131.8	1.4	93.9	51.2834	42.6166	43.8584	39.0136
1	126.9203	2.15	11.46852	7.515	-0.75	936	-9.3	-110.8	-140.8	1.4	102.9	53.0557	49.8443	43.8427	39.8927
1	119.5561	2.15	10.64795	8.098	-0.75	936	-9.3	-103.1	-133.1	1.4	95.2	52.4108	42.7892	43.8488	39.5519
1	125.6298	2.15	12.38207	6.958	-0.65	936	-9.3	-112.3	-142.3	1.5	104.5	53.7214	50.7786	43.8360	40.2721
1	121.7655	2.15	11.7404	7.340	-0.75	936	-9.3	-108.7	-138.7	1.4	100.8	53.2592	47.5408	43.8407	40.0056
1	123.1448	2.15	13.19922	6.525	-0.65	936	-9.3	-109.8	-139.8	1.5	102	54.2765	47.7235	43.8299	40.6114
1	116.0215	2.15	11.87969	7.254	-0.75	936	-9.3	-104.8	-134.8	1.4	96.9	53.3616	43.5384	43.8397	40.0634
1	118.9316	2.15	12.7599	6.751	-0.65	936	-9.3	-106.8	-136.8	1.5	99	53.9825	45.0175	43.8332	40.4290
1	117.2029	2.15	8.963883	9.633	-0.75	936	-9.3	-103.8	-133.8	1.4	95.9	50.9154	44.9846	43.8613	38.8525
1	107.5123	2.15	8.769698	9.848	-0.75	936	-9.3	-108.5	-138.5	1.4	100.6	50.7252	49.8748	43.8627	38.7719
1	100.6365	2.15	8.477122	10.192	-0.75	936	-9.3	-105.2	-135.2	1.4	97.3	50.4305	46.8695	43.8649	38.6503
1	111.6891	2.15	9.588535	9.000	-0.75	936	-9.3	-100.2	-130.2	1.4	92.3	51.5006	40.7994	43.8566	39.1119
1	102.019	2.15	9.626027	8.965	-0.75	936	-9.3	-99.9	-129.9	1.4	92	51.5345	40.4655	43.8564	39.1275
1	107.5143	2.15	10.34379	8.338	-0.75	936	-9.3	-102.1	-132.1	1.4	94.2	52.1591	42.0409	43.8511	39.4256
1	100.4774	2.15	10.50098	8.212	-0.75	936	-9.3	-106.8	-136.8	1.4	98.9	52.2901	46.6099	43.8499	39.4909
1	109.7383	2.15	11.49806	7.496	-0.75	936	-9.3	-105.2	-135.2	1.4	97.3	53.0780	44.2220	43.8425	39.9049
1	104.8638	2.15	11.01783	7.825	-0.75	936	-9.3	-97.6	-127.6	1.4	89.7	52.7074	36.9926	43.8461	39.7055
1	100.35	2.15	11.45341	7.525	-0.75	936	-9.3	-104.7	-134.7	1.4	96.8	53.0442	43.7558	43.8428	39.8864
1	117.3635	2.15	14.19936	6.064	-0.65	936	-9.3	-107.7	-137.7	1.5	99.9	54.9109	44.9891	43.8225	41.0268
1	110.1934	2.15	13.58288	6.340	-0.65	936	-9.3	-108.2	-138.2	1.5	100.4	54.5254	45.8746	43.8271	40.7708
1	111.7864	2.15	14.25143	6.042	-0.65	936	-9.3	-109.7	-139.7	1.5	101.9	54.9427	46.9573	43.8221	41.0484
1	110.1524	2.15	14.53256	5.924	-0.65	936	-9.3	-110.8	-140.8	1.5	103	55.1124	47.8876	43.8201	41.1652
1	106.401	2.15	14.24563	6.044	-0.65	936	-9.3	-105.6	-135.6	1.5	97.8	54.9392	42.8608	43.8222	41.0460
1	114.1162	2.15	14.83414	5.804	-0.65	936	-9.3	-110.5	-140.5	1.5	102.7	55.2908	47.4092	43.8178	41.2904
1	109.204	2.15	15.15352	5.681	-0.65	936	-9.3	-108	-138	1.5	100.2	55.4758	44.7242	43.8155	41.4231
1	112.3275	2.15	16.65099	5.168	-0.65	936	-9.3	-104.8	-134.8	1.5	97	56.2943	40.7057	43.8044	42.0450
1	110.1229	2.15	16.17269	5.322	-0.65	936	-9.3	-106.4	-136.4	1.5	98.6	56.0412	42.5588	43.8079	41.8463
1	105.845	2.15	15.74722	5.466	-0.65	936	-9.3	-109.5	-139.5	1.5	101.7	55.8096	45.8904	43.8111	41.6696

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TOMA DE MEDICIONES EN EL EX CONVENTO DE TECAMACHALCO, PUEBLA A 936 MHZ	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX			Gt(φi+θi)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Li"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema
								dBm	dBm	dB						
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB	
1	108.8247	2.15	13.5643	6.349	-0.65	936	-9.3	-103.4	-133.4	1.5	95.6	54.5135	41.0865	43.8272	40.7631	
1	102.4295	2.15	13.23346	6.508	-0.65	936	-9.3	-107.4	-137.4	1.5	99.6	54.2990	45.3010	43.8297	40.6257	
1	105.9117	2.15	14.08675	6.113	-0.65	936	-9.3	-100.8	-130.8	1.5	93	54.8417	38.1583	43.8234	40.9800	
1	99.78945	2.15	13.90241	6.194	-0.65	936	-9.3	-103.7	-133.7	1.5	95.9	54.7273	41.1727	43.8247	40.9035	
1	106.1916	2.15	14.77953	5.825	-0.65	936	-9.3	-105.5	-135.5	1.5	97.7	55.2587	42.4413	43.8182	41.2677	
1	101.8402	2.15	14.69783	5.858	-0.65	936	-9.3	-104.3	-134.3	1.5	96.5	55.2106	41.2894	43.8188	41.2338	
1	105.0577	2.15	15.853	5.429	-0.65	936	-9.3	-104.4	-134.4	1.5	96.6	55.8677	40.7323	43.8103	41.7136	
1	97.61901	2.15	15.60941	5.514	-0.65	936	-9.3	-113.6	-143.6	1.5	105.8	55.7332	50.0668	43.8121	41.6124	
1	105.4038	2.15	16.63283	5.174	-0.65	936	-9.3	-105.3	-135.3	1.5	97.5	56.2848	41.2152	43.8045	42.0374	
1	100.1061	2.15	16.31112	5.276	-0.65	936	-9.3	-104.4	-134.4	1.5	96.6	56.1152	40.4848	43.8069	41.9038	
1	112.9134	2.15	19.5778	4.394	-0.55	936	-9.3	-110.2	-140.2	1.6	102.5	57.7008	44.7992	43.7827	43.2605	
1	110.2324	2.15	18.91287	4.549	-0.55	936	-9.3	-111.8	-141.8	1.6	104.1	57.4007	46.6993	43.7876	42.9843	
1	109.5173	2.15	19.81198	4.342	-0.55	936	-9.3	-114.4	-144.4	1.6	106.7	57.8041	48.8959	43.7810	43.3577	
1	106.8174	2.15	19.10348	4.503	-0.55	936	-9.3	-107.5	-137.5	1.6	99.8	57.4878	42.3122	43.7862	43.0635	
1	111.584	2.15	20.60572	4.175	-0.55	936	-9.3	-113.2	-143.2	1.6	105.5	58.1453	47.3547	43.7751	43.6874	
1	107.1695	2.15	20.24539	4.249	-0.55	936	-9.3	-106.6	-136.6	1.6	98.9	57.9920	40.9080	43.7778	43.5377	
1	109.716	2.15	21.12884	4.071	-0.55	936	-9.3	-114.8	-144.8	1.6	107.1	58.3630	48.7370	43.7712	43.9046	
1	110.0297	2.15	22.09427	3.893	-0.55	936	-9.3	-111	-141	1.6	103.3	58.7511	44.5489	43.7641	44.3055	
1	107.2849	2.15	21.32343	4.034	-0.55	936	-9.3	-109.3	-139.3	1.6	101.6	58.4427	43.1573	43.7698	43.9854	
1	104.9787	2.15	21.13976	4.069	-0.55	936	-9.3	-117	-147	1.6	109.3	58.3675	50.9325	43.7712	43.9091	
1	103.4355	2.15	18.56718	4.634	-0.55	936	-9.3	-109.2	-139.2	1.6	101.5	57.2404	44.2596	43.7902	42.8407	
1	100.9716	2.15	18.66036	4.611	-0.55	936	-9.3	-105.6	-135.6	1.6	97.9	57.2839	40.6161	43.7895	42.8794	
1	97.94201	2.15	18.15562	4.739	-0.55	936	-9.3	-110.3	-140.3	1.6	102.6	57.0457	45.5543	43.7932	42.6698	
1	102.8578	2.15	19.51563	4.408	-0.55	936	-9.3	-107.4	-137.4	1.6	99.7	57.6732	42.0268	43.7832	43.2346	
1	98.05357	2.15	19.1169	4.500	-0.55	936	-9.3	-113.1	-143.1	1.6	105.4	57.4939	47.9061	43.7861	43.0690	
1	104.3487	2.15	20.5131	4.193	-0.55	936	-9.3	-107.4	-137.4	1.6	99.7	58.1061	41.5939	43.7758	43.6489	
1	101.4212	2.15	20.25562	4.247	-0.55	936	-9.3	-109	-139	1.6	101.3	57.9964	43.3036	43.7777	43.5420	
1	98.89831	2.15	20.09726	4.280	-0.55	936	-9.3	-110.8	-140.8	1.6	103.1	57.9283	45.1717	43.7789	43.4762	
1	100.6365	2.15	20.91226	4.113	-0.55	936	-9.3	-109.3	-139.3	1.6	101.6	58.2735	43.3265	43.7728	43.8147	
1	98.0373	2.15	21.00946	4.094	-0.55	936	-9.3	-114.4	-144.4	1.6	106.7	58.3138	48.3862	43.7721	43.8550	
1	33.63859	2.15	6.353424	13.656	-0.85	936	-9.3	-101.7	-131.7	1.3	93.7	47.9257	45.7743	43.8806	37.7684	
1	47.38012	2.15	5.980301	14.526	-0.85	936	-9.3	-104	-134	1.3	96	47.4000	48.6000	43.8833	37.6134	
1	50.12077	2.15	7.131157	12.143	-0.85	936	-9.3	-99	-129	1.3	91	48.9287	42.0713	43.8748	38.0914	
1	52.52577	2.15	7.917815	10.920	-0.75	936	-9.3	-101.3	-131.3	1.4	93.4	49.8376	43.5624	43.8690	38.4181	
1	62.14873	2.15	7.91352	10.926	-0.75	936	-9.3	-97.2	-127.2	1.4	89.3	49.8329	39.4671	43.8690	38.4163	
1	59.83306	2.15	8.883406	9.721	-0.75	936	-9.3	-102.6	-132.6	1.4	94.7	50.8371	43.8629	43.8619	38.8191	
1	67.00791	2.15	9.590537	8.998	-0.75	936	-9.3	-100.2	-130.2	1.4	92.3	51.5024	40.7976	43.8566	39.1128	
1	56.63011	2.15	10.03921	8.593	-0.75	936	-9.3	-99.5	-129.5	1.4	91.6	51.8995	39.7005	43.8533	39.2991	
1	65.20967	2.15	10.6476	8.099	-0.75	936	-9.3	-101.3	-131.3	1.4	93.4	52.4105	40.9895	43.8488	39.5517	
1	62.5021	2.15	11.36178	7.586	-0.75	936	-9.3	-100.8	-130.8	1.4	92.9	52.9744	39.9256	43.8435	39.8483	
1	73.42945	2.15	13.30383	6.474	-0.65	936	-9.3	-104.6	-134.6	1.5	96.8	54.3450	42.4550	43.8292	40.6549	
1	68.57954	2.15	14.04493	6.131	-0.65	936	-9.3	-101.5	-131.5	1.5	93.7	54.8159	38.8841	43.8237	40.9627	
1	72.36181	2.15	14.6313	5.884	-0.65	936	-9.3	-104.1	-134.1	1.5	96.3	55.1712	41.1288	43.8193	41.2062	
1	76.78092	2.15	15.37888	5.597	-0.65	936	-9.3	-103.9	-133.9	1.5	96.1	55.6040	40.4960	43.8138	41.5166	
1	70.564	2.15	15.81866	5.441	-0.65	936	-9.3	-110	-140	1.5	102.2	55.8489	46.3511	43.8105	41.6993	
1	75.67015	2.15	16.63317	5.174	-0.65	936	-9.3	-106	-136	1.5	98.2	56.2850	41.9150	43.8045	42.0376	
1	73.17105	2.15	16.99117	5.065	-0.65	936	-9.3	-102.1	-132.1	1.5	94.3	56.4700	37.8300	43.8019	42.1862	
1	77.72274	2.15	17.60518	4.888	-0.55	936	-9.3	-103.5	-133.5	1.6	95.8	56.7783	39.0217	43.7973	42.4412	
1	75.46784	2.15	17.99638	4.781	-0.55	936	-9.3	-110.2	-140.2	1.6	102.5	56.9692	45.5308	43.7944	42.6037	
1	72.99564	2.15	18.04876	4.767	-0.55	936	-9.3	-109.4	-139.4	1.6	101.7	56.9945	44.7055	43.7940	42.6254	

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

POR:	Alfredo Florián Méndez
ASESORES:	M.C. Luis Gerardo Guerrero Ojeda (UDLAP) Dr. Alejandro Aragón Zavala (ITESM Qro.)
TOMA DE MEDICIONES EN EL EX CONVENTO DE TECAMACHALCO, PUEBLA A 959 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX		Gt(φ+θ)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "L"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB
1	154.6366	2.15	8.0319	10.763	-0.75	959	-7.5	-100.8	-130.8	1.4	94.7	50.1727	44.5273	44.0200	36.5058
1	145.3899	2.15	6.5646	13.209	-0.85	959	-7.5	-98.3	-128.3	1.3	92.1	48.4206	43.6794	44.0308	35.8965
1	142.8618	2.15	8.2535	10.471	-0.75	959	-7.5	-108.7	-138.7	1.4	102.6	50.4092	52.1908	44.0183	36.5979
1	136.1446	2.15	6.8912	12.572	-0.85	959	-7.5	-102.2	-132.2	1.3	96	48.8422	47.1578	44.0284	36.0321
1	138.426	2.15	9.7010	8.895	-0.75	959	-7.5	-104.5	-134.5	1.4	98.4	51.8127	46.5873	44.0076	37.1990
1	133.0942	2.15	8.2177	10.517	-0.75	959	-7.5	-106	-136	1.4	99.9	50.3714	49.5286	44.0186	36.5830
1	133.0508	2.15	9.8853	8.728	-0.75	959	-7.5	-110.7	-140.7	1.4	104.6	51.9761	52.6239	44.0062	37.2756
1	127.1829	2.15	8.9133	9.688	-0.75	959	-7.5	-108	-138	1.4	101.9	51.0771	50.8229	44.0134	36.8719
1	132.4078	2.15	10.7369	8.031	-0.75	959	-7.5	-100.9	-130.9	1.4	94.8	52.6940	42.1060	43.9999	37.6292
1	135.8961	2.15	6.9459	12.472	-0.85	959	-7.5	-99.6	-129.6	1.3	93.4	48.9109	44.4891	44.0280	36.0548
1	141.8182	2.15	5.4518	15.970	-0.85	959	-7.5	-99.8	-129.8	1.3	93.6	46.8072	46.7928	44.0391	35.4343
1	114.318	2.15	4.0518	21.728	-0.65	959	-7.5	-99.8	-129.8	1.5	93.8	44.2294	49.5706	44.0494	34.8529
1	128.7669	2.15	5.2343	16.653	-0.75	959	-7.5	-102.7	-132.7	1.4	96.6	46.4535	50.1465	44.0407	35.3440
1	130.6533	2.15	6.1565	14.102	-0.85	959	-7.5	-96.2	-126.2	1.3	90	47.8631	42.1369	44.0338	35.7270
1	113.1436	2.15	5.6722	15.334	-0.85	959	-7.5	-98.6	-128.6	1.3	92.4	47.1513	45.2487	44.0374	35.5258
1	116.9958	2.15	6.1343	14.154	-0.85	959	-7.5	-94.3	-124.3	1.3	88.1	47.8317	40.2683	44.0340	35.7178
1	115.5662	2.15	7.3383	11.795	-0.75	959	-7.5	-101.4	-131.4	1.4	95.3	49.3883	45.9117	44.0251	36.2178
1	107.0281	2.15	7.4935	11.547	-0.75	959	-7.5	-95.9	-125.9	1.4	89.8	49.5701	40.2299	44.0239	36.2823
1	114.9136	2.15	8.5130	10.149	-0.75	959	-7.5	-98.3	-128.3	1.4	92.2	50.6780	41.5220	44.0164	36.7056
1	109.6396	2.15	8.2599	10.463	-0.75	959	-7.5	-99.5	-129.5	1.4	93.4	50.4158	42.9842	44.0183	36.6005
1	132.6204	2.15	10.6651	8.085	-0.75	959	-7.5	-100.6	-130.6	1.4	94.5	52.6357	41.8643	44.0005	37.5994
1	125.2781	2.15	10.1196	8.524	-0.75	959	-7.5	-102.9	-132.9	1.4	96.8	52.1797	44.6203	44.0045	37.3729
1	119.6756	2.15	9.3518	9.230	-0.75	959	-7.5	-101.7	-131.7	1.4	95.6	51.4942	44.1058	44.0102	37.0540
1	126.9203	2.15	11.4685	7.515	-0.75	959	-7.5	-104.4	-134.4	1.4	98.3	53.2665	45.0335	43.9945	37.9331
1	119.5561	2.15	10.6480	8.098	-0.75	959	-7.5	-104	-134	1.4	97.9	52.6217	45.2783	44.0006	37.5923
1	125.6298	2.15	12.3821	6.958	-0.65	959	-7.5	-101.7	-131.7	1.5	95.7	53.9322	41.7678	43.9878	38.3125
1	121.7655	2.15	11.7404	7.340	-0.75	959	-7.5	-104.8	-134.8	1.4	98.7	53.4700	45.2300	43.9925	38.0460
1	123.1448	2.15	13.1992	6.525	-0.65	959	-7.5	-104.3	-134.3	1.5	98.3	54.4873	43.8127	43.9817	38.6518
1	116.0215	2.15	11.8797	7.254	-0.75	959	-7.5	-106.3	-136.3	1.4	100.2	53.5725	46.6275	43.9915	38.1038
1	118.9316	2.15	12.7599	6.751	-0.65	959	-7.5	-102.5	-132.5	1.5	96.5	54.1933	42.3067	43.9850	38.4694
1	117.2029	2.15	8.9639	9.633	-0.75	959	-7.5	-99	-129	1.4	92.9	51.1263	41.7737	44.0131	36.8929
1	107.5123	2.15	8.7697	9.848	-0.75	959	-7.5	-103.4	-133.4	1.4	97.3	50.9361	46.3639	44.0145	36.8123
1	100.6365	2.15	8.4771	10.192	-0.75	959	-7.5	-96.5	-126.5	1.4	90.4	50.6413	39.7587	44.0167	36.6907
1	111.6891	2.15	9.5885	9.000	-0.75	959	-7.5	-101.9	-131.9	1.4	95.8	51.7114	44.0886	44.0084	37.1523
1	102.019	2.15	9.6260	8.965	-0.75	959	-7.5	-107.7	-137.7	1.4	101.6	51.7453	49.8547	44.0082	37.1679
1	107.5143	2.15	10.3438	8.338	-0.75	959	-7.5	-97.7	-127.7	1.4	91.6	52.3700	39.2300	44.0029	37.4660
1	100.4774	2.15	10.5010	8.212	-0.75	959	-7.5	-104.5	-134.5	1.4	98.4	52.5010	45.8990	44.0017	37.5313
1	109.7383	2.15	11.4981	7.496	-0.75	959	-7.5	-96.8	-126.8	1.4	90.7	53.2889	37.4111	43.9943	37.9453
1	104.8638	2.15	11.0178	7.825	-0.75	959	-7.5	-99.8	-129.8	1.4	93.7	52.9183	40.7817	43.9979	37.7459
1	100.35	2.15	11.4534	7.525	-0.75	959	-7.5	-100.1	-130.1	1.4	94	53.2551	40.7449	43.9946	37.9268
1	117.3635	2.15	14.1994	6.064	-0.65	959	-7.5	-110.9	-140.9	1.5	104.9	55.1217	49.7783	43.9743	39.0672
1	110.1934	2.15	13.5829	6.340	-0.65	959	-7.5	-105.4	-135.4	1.5	99.4	54.7362	44.6638	43.9789	38.8112
1	111.7864	2.15	14.2514	6.042	-0.65	959	-7.5	-107.5	-137.5	1.5	101.5	55.1535	46.3465	43.9739	39.0888
1	110.1524	2.15	14.5326	5.924	-0.65	959	-7.5	-105.8	-135.8	1.5	99.8	55.3232	44.4768	43.9719	39.2056
1	106.401	2.15	14.2456	6.044	-0.65	959	-7.5	-105.7	-135.7	1.5	99.7	55.1500	44.5500	43.9740	39.0864
1	114.1162	2.15	14.8341	5.804	-0.65	959	-7.5	-108.1	-138.1	1.5	102.1	55.5016	46.5984	43.9696	39.3308
1	109.204	2.15	15.1535	5.681	-0.65	959	-7.5	-111.5	-141.5	1.5	105.5	55.6866	49.8134	43.9673	39.4635
1	112.3275	2.15	16.6510	5.168	-0.65	959	-7.5	-104.6	-134.6	1.5	98.6	56.5052	42.0948	43.9562	40.0854
1	110.1229	2.15	16.1727	5.322	-0.65	959	-7.5	-106	-136	1.5	100	56.2520	43.7480	43.9597	39.8867
1	105.845	2.15	15.7472	5.466	-0.65	959	-7.5	-107.7	-137.7	1.5	101.7	56.0204	45.6796	43.9629	39.7100

"CARACTERIZACIÓN DE LA CANTERA PARA SEÑALES DE RF"

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TOMA DE MEDICIONES EN EL EX CONVENTO DE TECAMACHALCO, PUEBLA A 959 MHz	

GROSOR DEL MURO "Gm"	ÁNGULO TIERRA "φ"	GANANCIA φi	DISTANCIA EN AIRE "Dm"	ÁNGULO AIRE "θ"	GANANCIA θi	FRECUENCIA DE TX "F"	POTENCIA DE TX	POTENCIA DE RX			G(φ+θ)	PÉRDIDA DE TRAYECTORIA POR MUESTRA "Li"	PÉRDIDA ESPACIO LIBRE "Fs"	LOSS EXCESS "Lex"	LOSS EXCESS "Lex" con Ec De Regresión de Puebla	LOSS EXCESS "Lex" con Ec. De Regresión del Sistema
								dBm	dBm	dB						
METROS	GRADOS	dB	METROS	GRADOS	dB	MHZ	dBm	dBm	dB	dB	dB	dB	dB	dB	dB	
1	108.8247	2.15	13.5643	6.349	-0.65	959	-7.5	-107.3	-137.3	1.5	101.3	54.7243	46.5757	43.9790	38.8035	
1	102.4295	2.15	13.2335	6.508	-0.65	959	-7.5	-107.6	-137.6	1.5	101.6	54.5098	47.0902	43.9815	38.6661	
1	105.9117	2.15	14.0867	6.113	-0.65	959	-7.5	-101.6	-131.6	1.5	95.6	55.0526	40.5474	43.9752	39.0204	
1	99.78945	2.15	13.9024	6.194	-0.65	959	-7.5	-102.2	-132.2	1.5	96.2	54.9382	41.2618	43.9765	38.9439	
1	106.1916	2.15	14.7795	5.825	-0.65	959	-7.5	-108.8	-138.8	1.5	102.8	55.4696	47.3304	43.9700	39.3081	
1	101.8402	2.15	14.6978	5.858	-0.65	959	-7.5	-103.1	-133.1	1.5	97.1	55.4214	41.6786	43.9706	39.2742	
1	105.0577	2.15	15.8530	5.429	-0.65	959	-7.5	-104	-134	1.5	98	56.0786	41.9214	43.9621	39.7540	
1	97.61901	2.15	15.6094	5.514	-0.65	959	-7.5	-106.4	-136.4	1.5	100.4	55.9441	44.4559	43.9639	39.6528	
1	105.4038	2.15	16.6328	5.174	-0.65	959	-7.5	-108.7	-138.7	1.5	102.7	56.4957	46.2043	43.9563	40.0778	
1	100.1061	2.15	16.3111	5.276	-0.65	959	-7.5	-106.9	-136.9	1.5	100.9	56.3260	44.5740	43.9587	39.9442	
1	112.9134	2.15	19.5778	4.394	-0.55	959	-7.5	-106.7	-136.7	1.6	100.8	57.9117	42.8883	43.9345	41.3009	
1	110.2324	2.15	18.9129	4.549	-0.55	959	-7.5	-106.6	-136.6	1.6	100.7	57.6115	43.0885	43.9394	41.0247	
1	109.5173	2.15	19.8120	4.342	-0.55	959	-7.5	-100.8	-130.8	1.6	94.9	58.0149	36.8851	43.9328	41.3981	
1	106.8174	2.15	19.1035	4.503	-0.55	959	-7.5	-107.2	-137.2	1.6	101.3	57.6986	43.6014	43.9380	41.1039	
1	111.584	2.15	20.6057	4.175	-0.55	959	-7.5	-99.8	-129.8	1.6	93.9	58.3561	35.5439	43.9269	41.7278	
1	107.1695	2.15	20.2454	4.249	-0.55	959	-7.5	-108.4	-138.4	1.6	102.5	58.2029	44.2971	43.9296	41.5781	
1	109.716	2.15	21.1288	4.071	-0.55	959	-7.5	-109.8	-139.8	1.6	103.9	58.5739	45.3261	43.9230	41.9450	
1	110.0297	2.15	22.0943	3.893	-0.55	959	-7.5	-108.5	-138.5	1.6	102.6	58.9620	43.6380	43.9159	42.3459	
1	107.2849	2.15	21.3234	4.034	-0.55	959	-7.5	-105.5	-135.5	1.6	99.6	58.6535	40.9465	43.9216	42.0258	
1	104.9787	2.15	21.1398	4.069	-0.55	959	-7.5	-111.5	-141.5	1.6	105.6	58.5784	47.0216	43.9230	41.9495	
1	103.4355	2.15	18.5672	4.634	-0.55	959	-7.5	-104.5	-134.5	1.6	98.6	57.4513	41.1487	43.9420	40.8811	
1	100.9716	2.15	18.6604	4.611	-0.55	959	-7.5	-103.3	-133.3	1.6	97.4	57.4948	39.9052	43.9413	40.9198	
1	97.94201	2.15	18.1556	4.739	-0.55	959	-7.5	-102.7	-132.7	1.6	96.8	57.2566	39.5434	43.9450	40.7102	
1	102.8578	2.15	19.5156	4.408	-0.55	959	-7.5	-101	-131	1.6	95.1	57.8840	37.2160	43.9350	41.2750	
1	98.05357	2.15	19.1169	4.500	-0.55	959	-7.5	-103.2	-133.2	1.6	97.3	57.7047	39.5953	43.9379	41.1094	
1	104.3487	2.15	20.5131	4.193	-0.55	959	-7.5	-106.6	-136.6	1.6	100.7	58.3170	42.3830	43.9276	41.6893	
1	101.4212	2.15	20.2556	4.247	-0.55	959	-7.5	-109.3	-139.3	1.6	103.4	58.2073	45.1927	43.9295	41.5824	
1	98.89831	2.15	20.0973	4.280	-0.55	959	-7.5	-108.2	-138.2	1.6	102.3	58.1391	44.1609	43.9307	41.5166	
1	100.6365	2.15	20.9123	4.113	-0.55	959	-7.5	-110.1	-140.1	1.6	104.2	58.4844	45.7156	43.9246	41.8551	
1	98.0373	2.15	21.0095	4.094	-0.55	959	-7.5	-108.4	-138.4	1.6	102.5	58.5247	43.9753	43.9239	41.8954	
1	33.63859	2.15	6.3534	13.656	-0.85	959	-7.5	-100.5	-130.5	1.3	94.3	48.1365	46.1635	44.0324	35.8088	
1	47.38012	2.15	5.9803	14.526	-0.85	959	-7.5	-101	-131	1.3	94.8	47.6108	47.1892	44.0351	35.6538	
1	50.12077	2.15	7.1312	12.143	-0.85	959	-7.5	-101.2	-131.2	1.3	95	49.1396	45.8604	44.0266	36.1318	
1	52.52577	2.15	7.9178	10.920	-0.75	959	-7.5	-102.1	-132.1	1.4	96	50.0485	45.9515	44.0208	36.4585	
1	62.14873	2.15	7.9135	10.926	-0.75	959	-7.5	-104.5	-134.5	1.4	98.4	50.0438	48.3562	44.0208	36.4567	
1	59.83306	2.15	8.8834	9.721	-0.75	959	-7.5	-100.6	-130.6	1.4	94.5	51.0480	43.4520	44.0137	36.8595	
1	67.00791	2.15	9.5905	8.998	-0.75	959	-7.5	-100.1	-130.1	1.4	94	51.7132	42.2868	44.0084	37.1532	
1	56.63011	2.15	10.0392	8.593	-0.75	959	-7.5	-101.8	-131.8	1.4	95.7	52.1104	43.5896	44.0051	37.3395	
1	65.20967	2.15	10.6476	8.099	-0.75	959	-7.5	-104.7	-134.7	1.4	98.6	52.6214	45.9786	44.0006	37.5921	
1	62.5021	2.15	11.3618	7.586	-0.75	959	-7.5	-102.9	-132.9	1.4	96.8	53.1853	43.6147	43.9953	37.8887	
1	73.42945	2.15	13.3038	6.474	-0.65	959	-7.5	-103.6	-133.6	1.5	97.6	54.5559	43.0441	43.9810	38.6953	
1	68.57954	2.15	14.0449	6.131	-0.65	959	-7.5	-101.5	-131.5	1.5	95.5	55.0268	40.4732	43.9755	39.0031	
1	72.36181	2.15	14.6313	5.884	-0.65	959	-7.5	-105.6	-135.6	1.5	99.6	55.3820	44.2180	43.9711	39.2466	
1	76.78092	2.15	15.3789	5.597	-0.65	959	-7.5	-97.3	-127.3	1.5	91.3	55.8149	35.4851	43.9656	39.5570	
1	70.564	2.15	15.8187	5.441	-0.65	959	-7.5	-102.3	-132.3	1.5	96.3	56.0598	40.2402	43.9623	39.7397	
1	75.67015	2.15	16.6332	5.174	-0.65	959	-7.5	-104.8	-134.8	1.5	98.8	56.4959	42.3041	43.9563	40.0780	
1	73.17105	2.15	16.9912	5.065	-0.65	959	-7.5	-103	-133	1.5	97	56.6808	40.3192	43.9537	40.2266	
1	77.72274	2.15	17.6052	4.888	-0.55	959	-7.5	-103.4	-133.4	1.6	97.5	56.9892	40.5108	43.9491	40.4816	
1	75.46784	2.15	17.9964	4.781	-0.55	959	-7.5	-104.5	-134.5	1.6	98.6	57.1801	41.4199	43.9462	40.6441	
1	72.99564	2.15	18.0488	4.767	-0.55	959	-7.5	-102.7	-132.7	1.6	96.8	57.2053	39.5947	43.9458	40.6658	