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## LFI QM FEED HORNS CORRUGATION DATA

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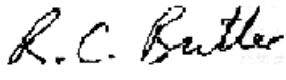

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## 1 INTRODUCTION AND SCOPE

This technical note reports the corrugation data of the LFI Qualification Model of the Feed Horns. The scope is to deliver the data to LABEN in order to start the industrial activity about these horns according to the overall Planck/LFI QM development schedule. According to the LFI model development, the following horn will be manufactured a QMs:

<b>Frequency</b>	<b>ID Number</b>	<b>Design Reference Number</b>	<b>Part Number</b>
30 GHz	28	PG10	PLAAA-P
44 GHz	24	PG24	PLABA/01-P
70 GHz	18	PG26	PLACA/01-P
70 GHz	23	PG26	PLACA/01-P



## 2 APPLICABLE DOCUMENTS

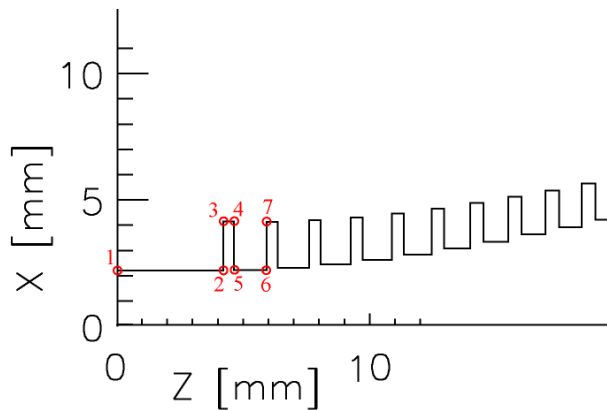
[AD 1] "Planck/LFI Feed Horns Requirement Specification", PL-LFI-PST-SP-005, Ver. 3.0, May 2003

## 3 DATA FORMAT

For each electromagnetic design, the data consist on a table in which the corrugation profile is reported as three column format (N,X,Z).

N is the progressive number of the corrugation from the throat to the aperture of the Horn. X is the radial coordinate and Z is the axial coordinate of each node (see figure below). Le line X=0 is the rotation axis of the horn.

**!!! X and Z are reported in mm !!!**

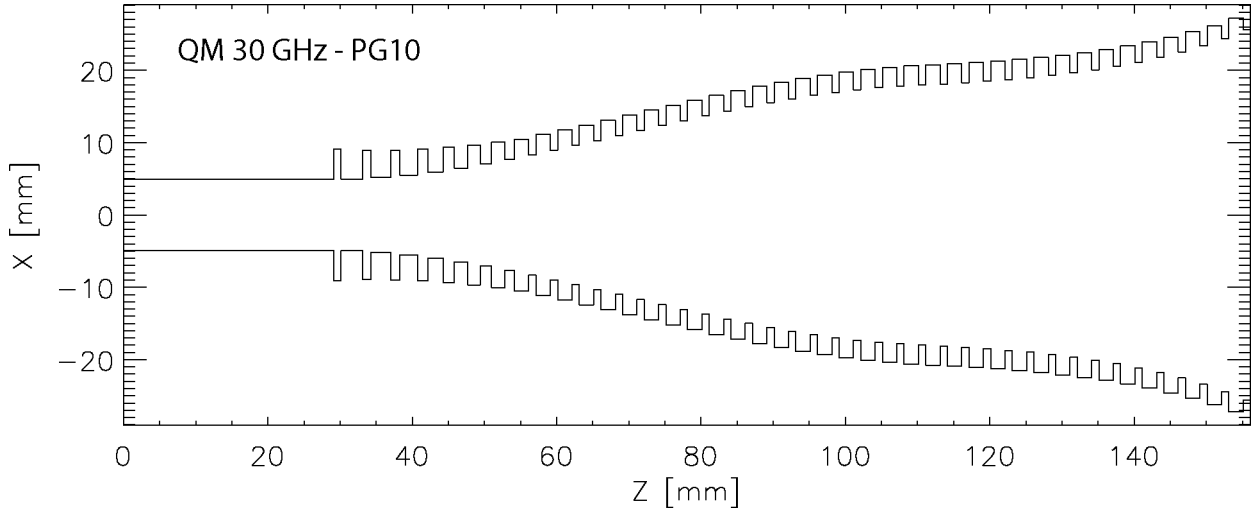


This is an example of the table. The corrugation with N=1 has always Z=0.

N	X	Z	N	X	Z	N	X	Z	N	X	Z
1	4.90	0.00	43	12.41	63.12	85	16.53	95.12	127	21.78	126.12
2	4.90	29.12	44	12.41	65.12	86	16.53	96.12	128	21.78	128.12
3	9.10	29.12	45	10.29	65.12	87	19.33	96.12	129	19.29	128.12
4	...	...	46	...	...	88	...	...	130	...	...
5	...	...	47	...	...	89	...	...	131	...	...



### 4 QM 30 GHz Feed Horn data



N	X	Z	N	X	Z	N	X	Z	N	X	Z
1	4.90	0.00	43	12.41	63.12	85	16.53	95.12	127	21.78	126.12
2	4.90	29.12	44	12.41	65.12	86	16.53	96.12	128	21.78	128.12
3	9.10	29.12	45	10.29	65.12	87	19.33	96.12	129	19.29	128.12
4	9.10	30.12	46	10.29	66.12	88	19.33	98.12	130	19.29	129.12
5	4.94	30.12	47	13.09	66.12	89	16.95	98.12	131	22.09	129.12
6	4.94	33.12	48	13.09	68.12	90	16.95	99.12	132	22.09	131.12
7	8.94	33.12	49	10.98	68.12	91	19.75	99.12	133	19.66	131.12
8	8.94	34.26	50	10.98	69.12	92	19.75	101.12	134	19.66	132.12
9	5.17	34.26	51	13.78	69.12	93	17.30	101.12	135	22.46	132.12
10	5.17	36.97	52	13.78	71.12	94	17.30	102.12	136	22.46	134.12
11	8.97	36.97	53	11.68	71.12	95	20.10	102.12	137	20.07	134.12
12	8.97	38.26	54	11.68	72.12	96	20.10	104.12	138	20.07	135.12
13	5.51	38.26	55	14.48	72.12	97	17.59	104.12	139	22.87	135.12
14	5.51	40.69	56	14.48	74.12	98	17.59	105.12	140	22.87	137.12
15	9.11	40.69	57	12.38	74.12	99	20.39	105.12	141	20.56	137.12
16	9.11	42.12	58	12.38	75.12	100	20.39	107.12	142	20.56	138.12
17	5.95	42.12	59	15.18	75.12	101	17.81	107.12	143	23.36	138.12
18	5.95	44.26	60	15.18	77.12	102	17.81	108.12	144	23.36	140.12
19	9.35	44.26	61	13.06	77.12	103	20.61	108.12	145	21.12	140.12
20	9.35	45.83	62	13.06	78.12	104	20.61	110.12	146	21.12	141.12
21	6.47	45.83	63	15.86	78.12	105	17.96	110.12	147	23.92	141.12
22	6.47	47.69	64	15.86	80.12	106	17.96	111.12	148	23.92	143.12
23	9.67	47.69	65	13.73	80.12	107	20.76	111.12	149	21.77	143.12
24	9.67	49.40	66	13.73	81.12	108	20.76	113.12	150	21.77	144.12
25	7.05	49.40	67	16.53	81.12	109	18.10	113.12	151	24.57	144.12
26	7.05	50.97	68	16.53	83.12	110	18.10	114.12	152	24.57	146.12
27	10.05	50.97	69	14.37	83.12	111	20.90	114.12	153	22.52	146.12
28	10.05	52.83	70	14.37	84.12	112	20.90	116.12	154	22.52	147.12
29	7.68	52.83	71	17.17	84.12	113	18.28	116.12	155	25.32	147.12
30	7.68	54.12	72	17.17	86.12	114	18.28	117.12	156	25.32	149.12
31	10.48	54.12	73	14.98	86.12	115	21.08	117.12	157	23.39	149.12





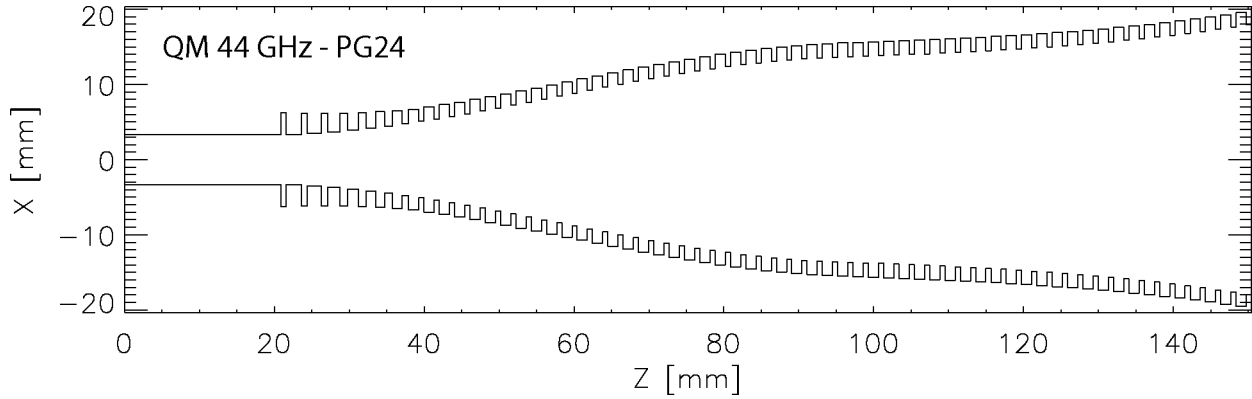
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N	X	Z	N	X	Z	N	X	Z	N	X	Z
32	10.48	56.12	74	14.98	87.12	116	21.08	119.12	158	23.39	150.12
33	8.32	56.12	75	17.78	87.12	117	18.48	119.12	159	26.19	150.12
34	8.32	57.12	76	17.78	89.12	118	18.48	120.12	160	26.19	152.12
35	11.12	57.12	77	15.54	89.12	119	21.28	120.12	161	24.40	152.12
36	11.12	59.12	78	15.54	90.12	120	21.28	122.12	162	24.40	153.12
37	8.96	59.12	79	18.34	90.12	121	18.71	122.12	163	27.20	153.12
38	8.96	60.12	80	18.34	92.12	122	18.71	123.12	164	27.20	155.12
39	11.76	60.12	81	16.06	92.12	123	21.51	123.12	165	25.57	155.12
40	11.76	62.12	82	16.06	93.12	124	21.51	125.12	166	25.57	156.12
41	9.61	62.12	83	18.86	93.12	125	18.98	125.12			
42	9.61	63.12	84	18.86	95.12	126	18.98	126.12			



## 5 QM 44 GHz Feed Horn Data



N	X	Z	N	X	Z	N	X	Z	N	X	Z	N	X	Z
1	3.341	0.000	51	8.364	48.140	101	11.463	74.056	151	15.656	99.290	201	15.144	125.206
2	3.341	20.865	52	8.364	49.504	102	11.463	74.738	152	15.656	100.654	202	15.144	125.888
3	6.273	20.865	53	6.832	49.504	103	13.372	74.738	153	13.818	100.654	203	17.053	125.888
4	6.273	21.547	54	6.832	50.186	104	13.372	76.102	154	13.818	101.336	204	17.053	127.252
5	3.366	21.547	55	8.742	50.186	105	11.785	76.102	155	15.727	101.336	205	15.306	127.252
6	3.366	23.592	56	8.742	51.550	106	11.785	76.784	156	15.727	102.700	206	15.306	127.934
7	6.152	23.592	57	7.220	51.550	107	13.694	76.784	157	13.895	102.700	207	17.215	127.934
8	6.152	24.371	58	7.220	52.232	108	13.694	78.148	158	13.895	103.382	208	17.215	129.298
9	3.505	24.371	59	9.129	52.232	109	12.086	78.148	159	15.804	103.382	209	15.479	129.298
10	3.505	26.222	60	9.129	53.596	110	12.086	78.830	160	15.804	104.746	210	15.479	129.980
11	6.144	26.222	61	7.616	53.596	111	13.995	78.830	161	13.976	104.746	211	17.388	129.980
12	6.144	27.099	62	7.616	54.278	112	13.995	80.194	162	13.976	105.428	212	17.388	131.344
13	3.690	27.099	63	9.525	54.278	113	12.366	80.194	163	15.885	105.428	213	15.663	131.344
14	3.690	28.755	64	9.525	55.642	114	12.366	80.876	164	15.885	106.792	214	15.663	132.026
15	6.184	28.755	65	8.017	55.642	115	14.275	80.876	165	14.063	106.792	215	17.572	132.026
16	6.184	29.729	66	8.017	56.324	116	14.275	82.240	166	14.063	107.474	216	17.572	133.390
17	3.916	29.729	67	9.926	56.324	117	12.623	82.240	167	15.972	107.474	217	15.858	133.390
18	3.916	31.190	68	9.926	57.688	118	12.623	82.922	168	15.972	108.838	218	15.858	134.072
19	6.263	31.190	69	8.421	57.688	119	14.532	82.922	169	14.155	108.838	219	17.767	134.072
20	6.263	32.261	70	8.421	58.370	120	14.532	84.286	170	14.155	109.520	220	17.767	135.436
21	4.175	32.261	71	10.330	58.370	121	12.855	84.286	171	16.064	109.520	221	16.067	135.436
22	4.175	33.527	72	10.330	59.734	122	12.855	84.968	172	16.064	110.884	222	16.067	136.118
23	6.376	33.527	73	8.826	59.734	123	14.764	84.968	173	14.253	110.884	223	17.976	136.118
24	6.376	34.696	74	8.826	60.416	124	14.764	86.332	174	14.253	111.566	224	17.976	137.482
25	4.461	34.696	75	10.735	60.416	125	13.062	86.332	175	16.162	111.566	225	16.289	137.482
26	4.461	35.767	76	10.735	61.780	126	13.062	87.014	176	16.162	112.930	226	16.289	138.164
27	6.516	35.767	77	9.228	61.780	127	14.971	87.014	177	14.358	112.930	227	18.198	138.164
28	6.516	37.033	78	9.228	62.462	128	14.971	88.378	178	14.358	113.612	228	18.198	139.528
29	4.768	37.033	79	11.137	62.462	129	13.241	88.378	179	16.267	113.612	229	16.525	139.528
30	4.768	37.910	80	11.137	63.826	130	13.241	89.060	180	16.267	114.976	230	16.525	140.210
31	6.677	37.910	81	9.626	63.826	131	15.150	89.060	181	14.469	114.976	231	18.434	140.210
32	6.677	39.274	82	9.626	64.508	132	15.150	90.424	182	14.469	115.658	232	18.434	141.574
33	5.090	39.274	83	11.535	64.508	133	13.393	90.424	183	16.378	115.658	233	16.776	141.574
34	5.090	39.956	84	11.535	65.872	134	13.393	91.106	184	16.378	117.022	234	16.776	142.256
35	6.999	39.956	85	10.017	65.872	135	15.302	91.106	185	14.588	117.022	235	18.685	142.256



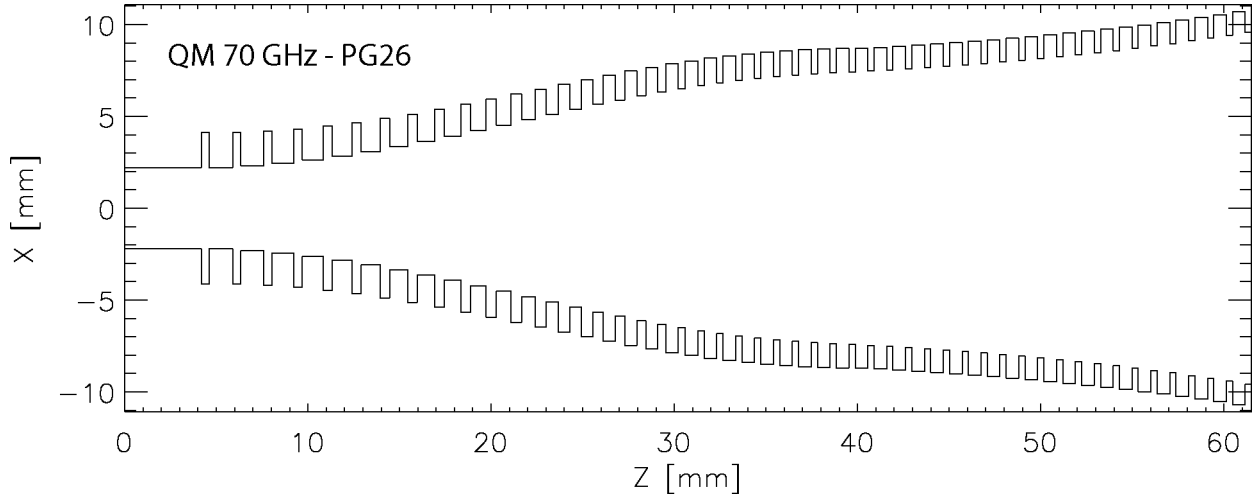
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N	X	Z	N	X	Z	N	X	Z	N	X	Z	N	X	Z
36	6.999	41.320	86	10.017	66.554	136	15.302	92.470	186	14.588	117.704	236	18.685	143.620
37	5.405	41.320	87	11.926	66.554	137	13.516	92.470	187	16.497	117.704	237	17.044	143.620
38	5.405	42.002	88	11.926	67.918	138	13.516	93.152	188	16.497	119.068	238	17.044	144.302
39	7.314	42.002	89	10.398	67.918	139	15.425	93.152	189	14.714	119.068	239	18.953	144.302
40	7.314	43.366	90	10.398	68.600	140	15.425	94.516	190	14.714	119.750	240	18.953	145.666
41	5.739	43.366	91	12.307	68.600	141	13.611	94.516	191	16.623	119.750	241	17.329	145.666
42	5.739	44.048	92	12.307	69.964	142	13.611	95.198	192	16.623	121.114	242	17.329	146.348
43	7.648	44.048	93	10.768	69.964	143	15.520	95.198	193	14.848	121.114	243	19.238	146.348
44	7.648	45.412	94	10.768	70.646	144	15.520	96.562	194	14.848	121.796	244	19.238	147.712
45	6.089	45.412	95	12.677	70.646	145	13.679	96.562	195	16.757	121.796	245	17.633	147.712
46	6.089	46.094	96	12.677	72.010	146	13.679	97.244	196	16.757	123.160	246	17.633	148.394
47	7.998	46.094	97	11.123	72.010	147	15.588	97.244	197	14.991	123.160	247	19.542	148.394
48	7.998	47.458	98	11.123	72.692	148	15.588	98.608	198	14.991	123.842	248	19.542	149.758
49	6.455	47.458	99	13.033	72.692	149	13.746	98.608	199	16.901	123.842	249	17.956	149.758
50	6.455	48.140	100	13.033	74.056	150	13.746	99.290	200	16.901	125.206	250	17.956	150.440



### 6 QM 70 GHz Feed Horn Data



N	X	Z	N	X	Z	N	X	Z	N	X	Z
1	2.21	0.00	51	6.48	22.40	101	7.25	36.44	151	9.34	49.14
2	2.21	4.18	52	6.48	22.99	102	7.25	36.78	152	9.34	49.83
3	4.14	4.18	53	5.11	22.99	103	8.63	36.78	153	8.15	49.83
4	4.14	4.61	54	5.11	23.68	104	8.63	37.47	154	8.15	50.17
5	2.22	4.61	55	6.75	23.68	105	7.31	37.47	155	9.43	50.17
6	2.22	5.90	56	6.75	24.28	106	7.31	37.81	156	9.43	50.86
7	4.13	5.90	57	5.38	24.28	107	8.67	37.81	157	8.25	50.86
8	4.13	6.34	58	5.38	24.92	108	8.67	38.50	158	8.25	51.20
9	2.31	6.34	59	7.00	24.92	109	7.36	38.50	159	9.53	51.20
10	2.31	7.58	60	7.00	25.54	110	7.36	38.84	160	9.53	51.89
11	4.20	7.58	61	5.65	25.54	111	8.69	38.84	161	8.35	51.89
12	4.20	8.04	62	5.65	26.13	112	8.69	39.53	162	8.35	52.23
13	2.45	8.04	63	7.24	26.13	113	7.41	39.53	163	9.64	52.23
14	2.45	9.23	64	7.24	26.76	114	7.41	39.87	164	9.64	52.92
15	4.31	9.23	65	5.89	26.76	115	8.72	39.87	165	8.46	52.92
16	4.31	9.70	66	5.89	27.30	116	8.72	40.56	166	8.46	53.26
17	2.63	9.70	67	7.47	27.30	117	7.47	40.56	167	9.75	53.26
18	2.63	10.84	68	7.47	27.95	118	7.47	40.90	168	9.75	53.95
19	4.47	10.84	69	6.12	27.95	119	8.75	40.90	169	8.58	53.95
20	4.47	11.32	70	6.12	28.44	120	8.75	41.59	170	8.58	54.29
21	2.84	11.32	71	7.67	28.44	121	7.53	41.59	171	9.86	54.29
22	2.84	12.41	72	7.67	29.10	122	7.53	41.93	172	9.86	54.98
23	4.66	12.41	73	6.33	29.10	123	8.81	41.93	173	8.70	54.98
24	4.66	12.91	74	6.33	29.54	124	8.81	42.62	174	8.70	55.32
25	3.08	12.91	75	7.86	29.54	125	7.59	42.62	175	9.98	55.32
26	3.08	13.95	76	7.86	30.21	126	7.59	42.96	176	9.98	56.01
27	4.88	13.95	77	6.51	30.21	127	8.88	42.96	177	8.83	56.01
28	4.88	14.46	78	6.51	30.60	128	8.88	43.65	178	8.83	56.35
29	3.35	14.46	79	8.02	30.60	129	7.66	43.65	179	10.11	56.35
30	3.35	15.45	80	8.02	31.29	130	7.66	43.99	180	10.11	57.04
31	5.12	15.45	81	6.68	31.29	131	8.94	43.99	181	8.96	57.04
32	5.12	15.97	82	6.68	31.63	132	8.94	44.68	182	8.96	57.38
33	3.63	15.97	83	8.17	31.63	133	7.73	44.68	183	10.25	57.38



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N	X	Z	N	X	Z	N	X	Z	N	X	Z
34	3.63	16.91	84	8.17	32.32	134	7.73	45.02	184	10.25	58.07
35	5.38	16.91	85	6.83	32.32	135	9.01	45.02	185	9.11	58.07
36	5.38	17.45	86	6.83	32.66	136	9.01	45.71	186	9.11	58.41
37	3.92	17.45	87	8.29	32.66	137	7.80	45.71	187	10.39	58.41
38	3.92	18.34	88	8.29	33.35	138	7.80	46.05	188	10.39	59.10
39	5.65	18.34	89	6.96	33.35	139	9.09	46.05	189	9.26	59.10
40	5.65	18.89	90	6.96	33.69	140	9.09	46.74	190	9.26	59.44
41	4.22	18.89	91	8.40	33.69	141	7.88	46.74	191	10.54	59.44
42	4.22	19.73	92	8.40	34.38	142	7.88	47.08	192	10.54	60.13
43	5.93	19.73	93	7.07	34.38	143	9.17	47.08	193	9.42	60.13
44	5.93	20.29	94	7.07	34.72	144	9.17	47.77	194	9.42	60.47
45	4.52	20.29	95	8.49	34.72	145	7.97	47.77	195	10.70	60.47
46	4.52	21.08	96	8.49	35.41	146	7.97	48.11	196	10.70	61.16
47	6.21	21.08	97	7.17	35.41	147	9.25	48.11	197	9.58	61.16
48	6.21	21.66	98	7.17	35.75	148	9.25	48.80	198	9.58	61.50
49	4.82	21.66	99	8.57	35.75	149	8.05	48.80			
50	4.82	22.40	100	8.57	36.44	150	8.05	49.14			