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		MEMO CONCERNS Comparison of measured Noise-Power-Distance data and NPD data from NORTIM			FOR YOUR ATTENTION	COMMENTS ARE INVITED	FOR YOUR INFORMATION	AS AGREED
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1 Introduction

Noise data from 155 flights have been measured at Gardermoen airport. The measurement procedures and subsequent data processing are described in the main report.

This memo presents figures where the measured noise data is compared to the corresponding noise curves from the NORTIM database. INM and NORTIM noise databases are identical with one exception: In the NORTIM database, the noise curves for MD80 type aircraft have been adjusted with + 1.5 dB for the takeoff thrusts 13000 Lbs. and 19000 Lbs.

For aircraft types where no NORTIM data exist, the following noise data have been used:

- B736 ⇒ 737500
- B737 ⇒ 737400
- MD87 ⇒ MD81

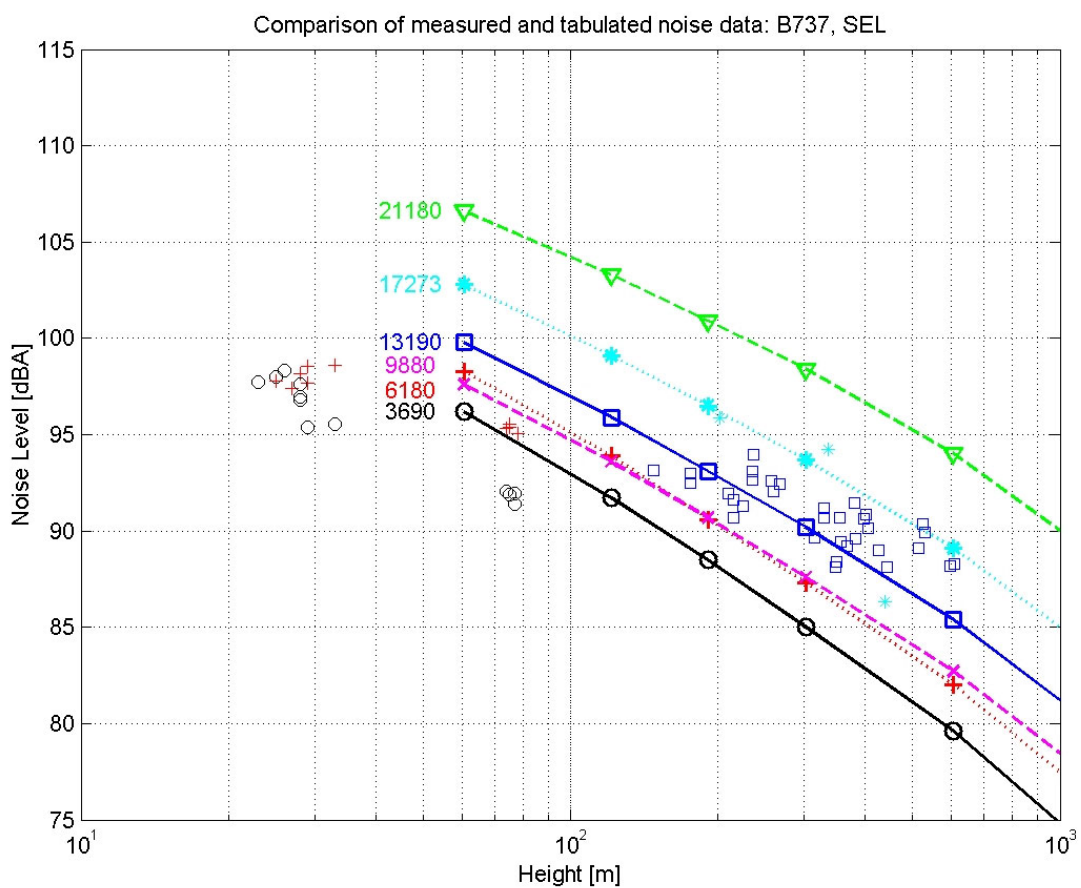
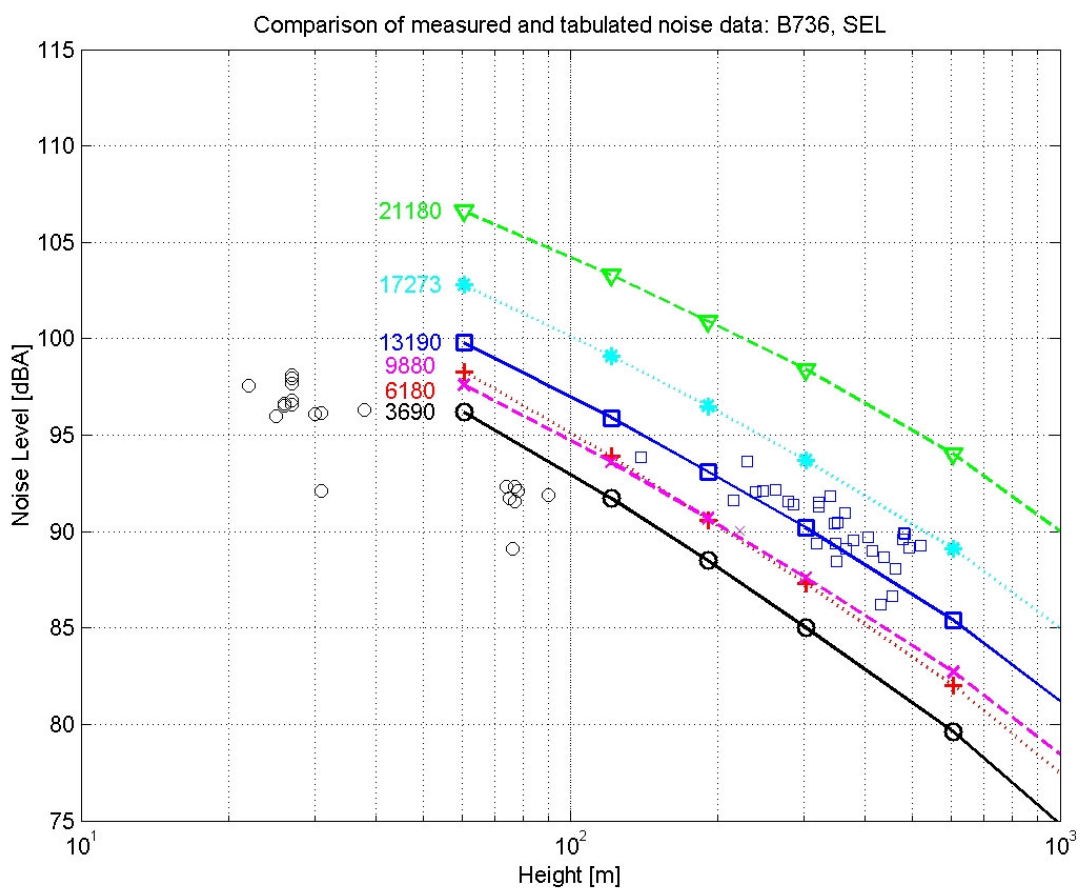
2 Results

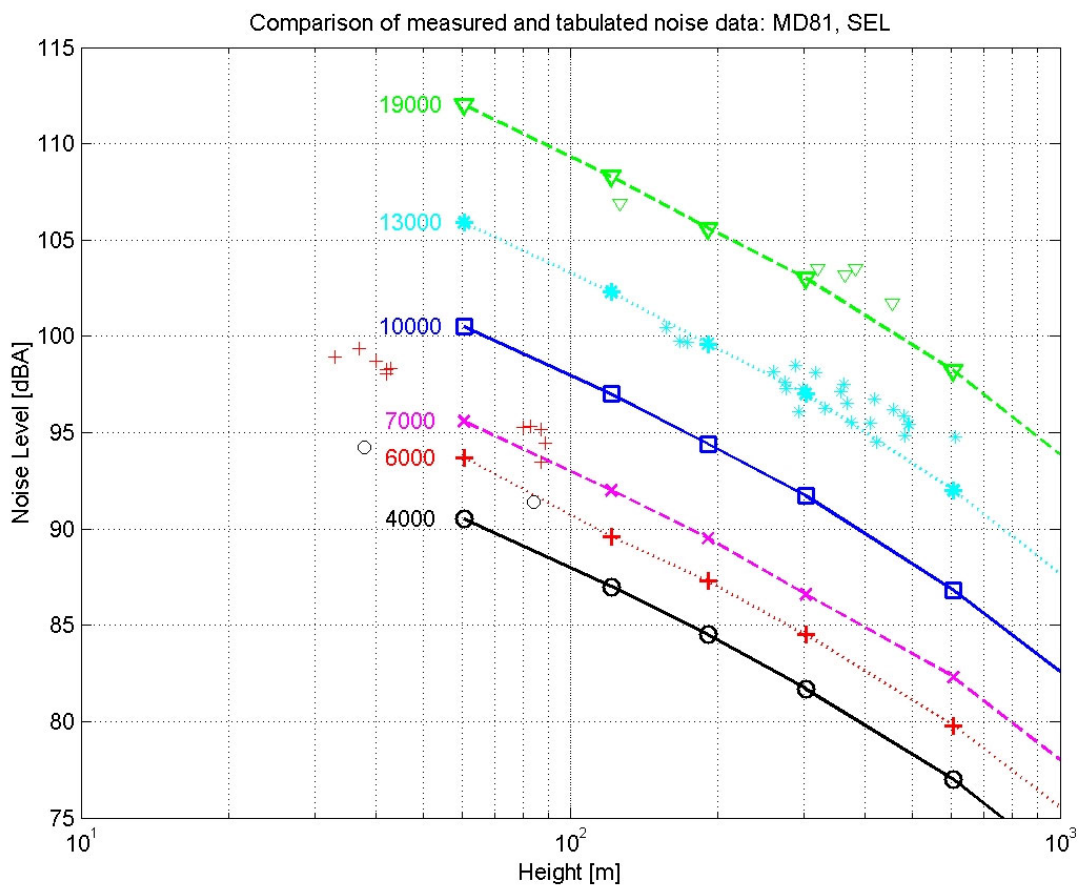
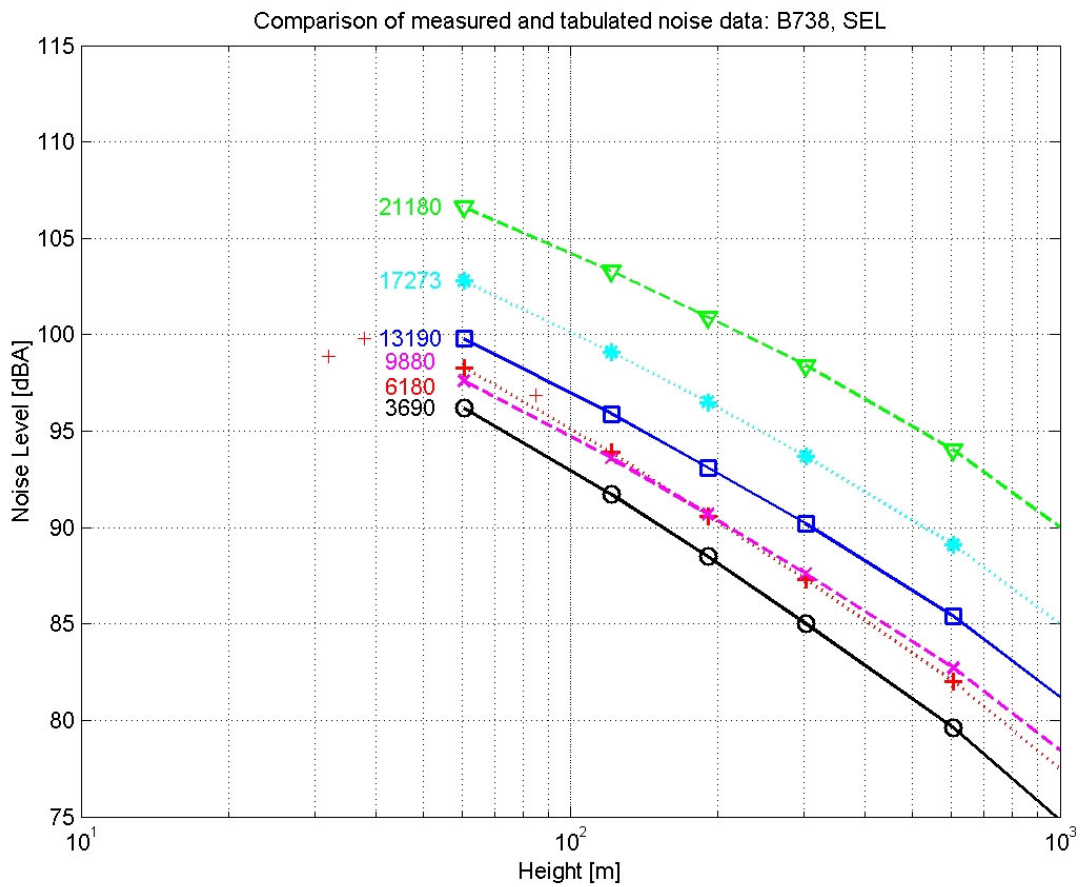
The database curves are plotted as they are: noise level as function of distance, with one curve per aircraft type, noise type (MAX or SEL) and thrust level. The measured noise data is referred to the distance of closest approach over the microphones. The measured noise values are corrected as follows:

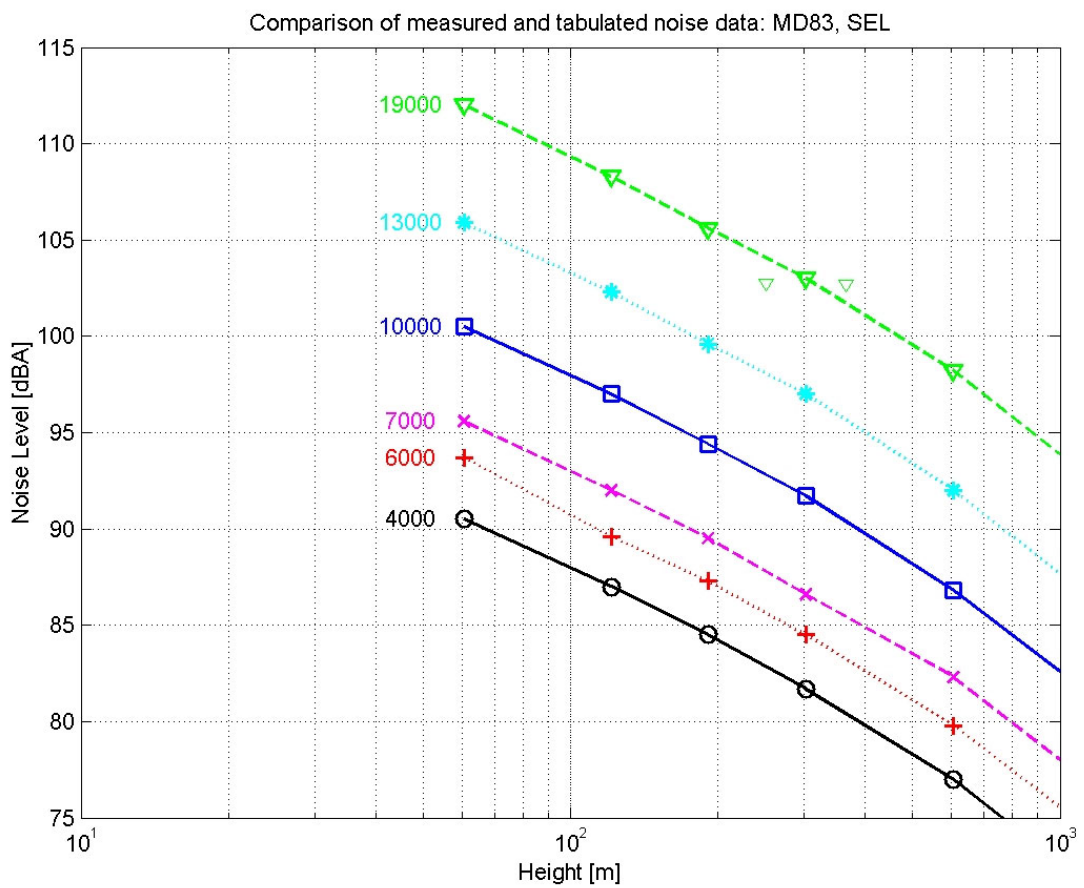
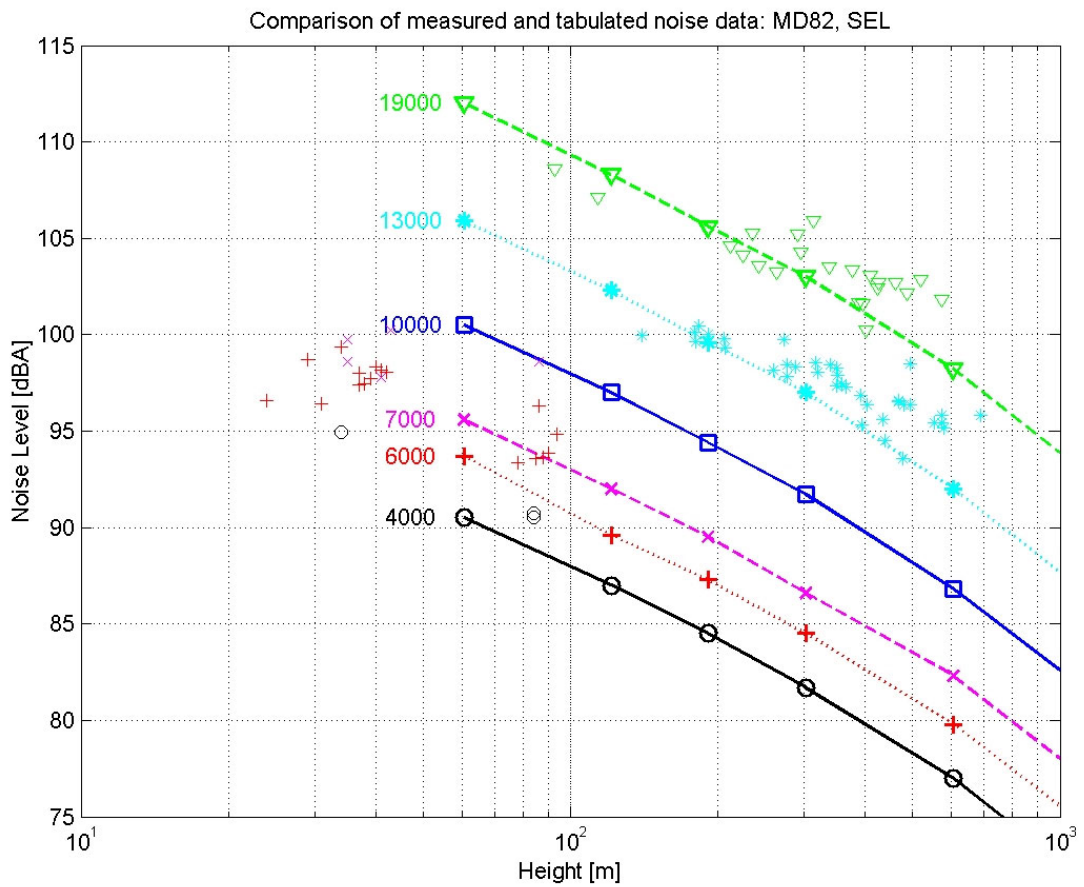
- Air absorption corresponding to an ISO atmosphere for the ambient temperature and relative humidity were added, and air absorption corresponding to the atmosphere given in SAE 1845 were subtracted.

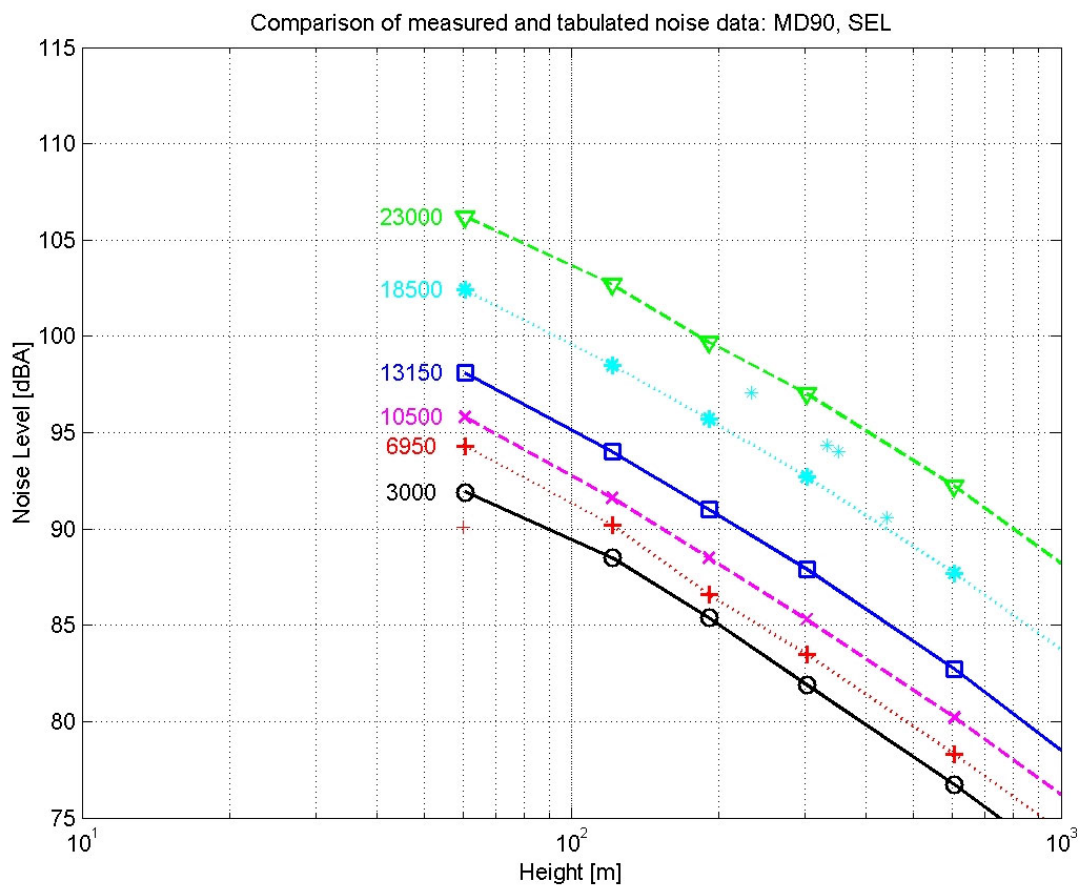
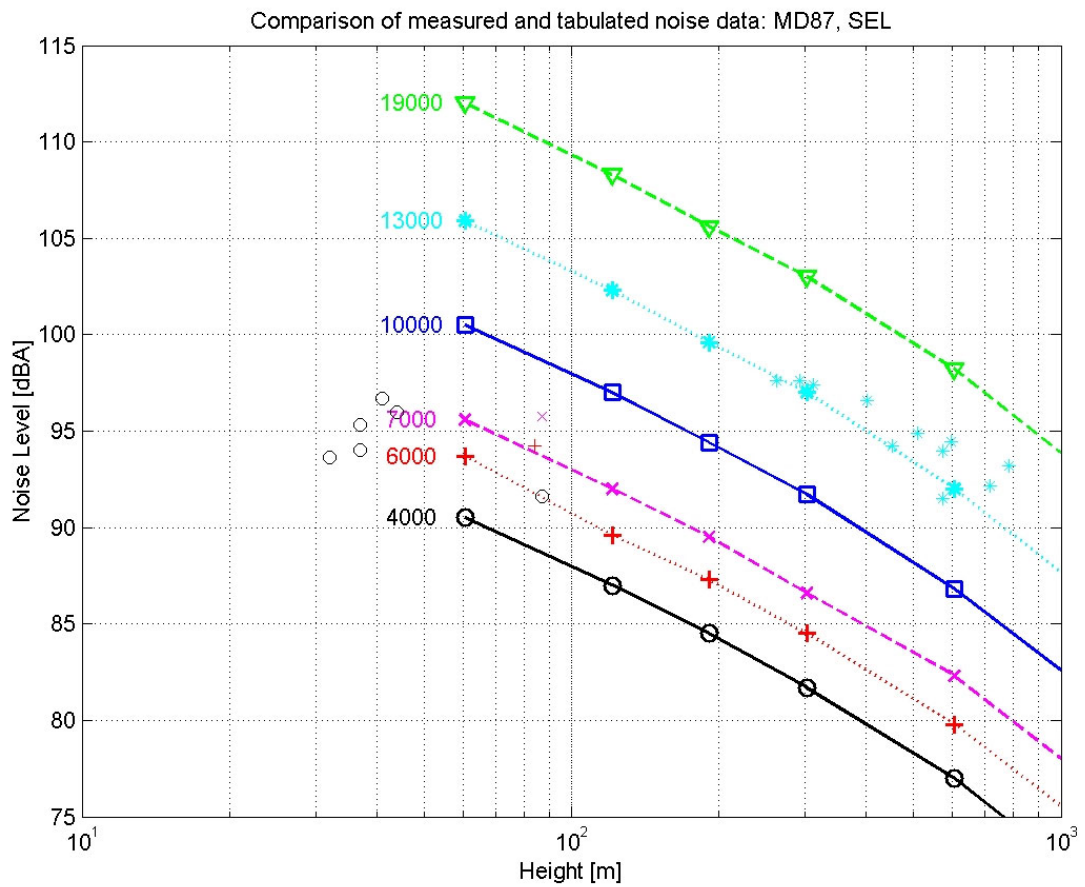
- For comparison with the NORTIM curves, the thrust levels of the measured data were grouped in intervals corresponding to the thrust levels of the NORTIM curves. The difference between the actual thrust level and the database thrust level of the group leads to an error. The error is estimated by interpolation in the NORTIM database. The difference between these interpolated values is subtracted from the measured noise level.

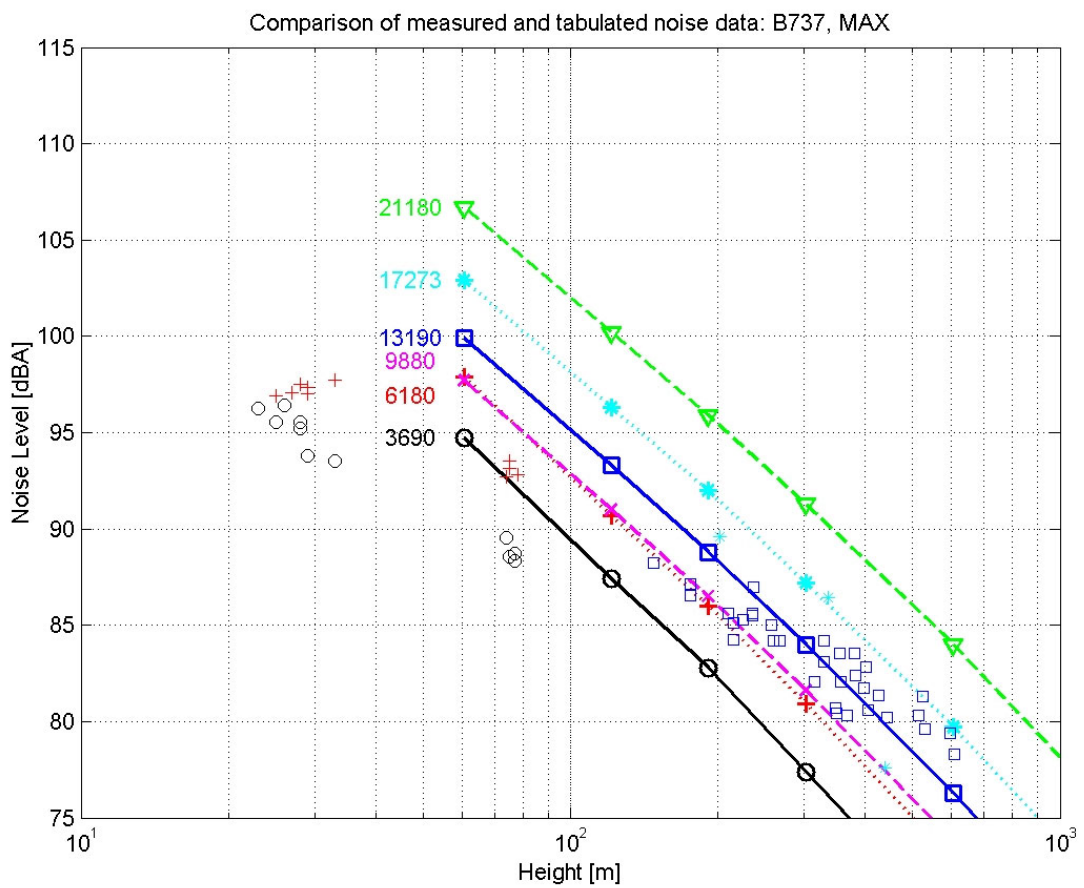
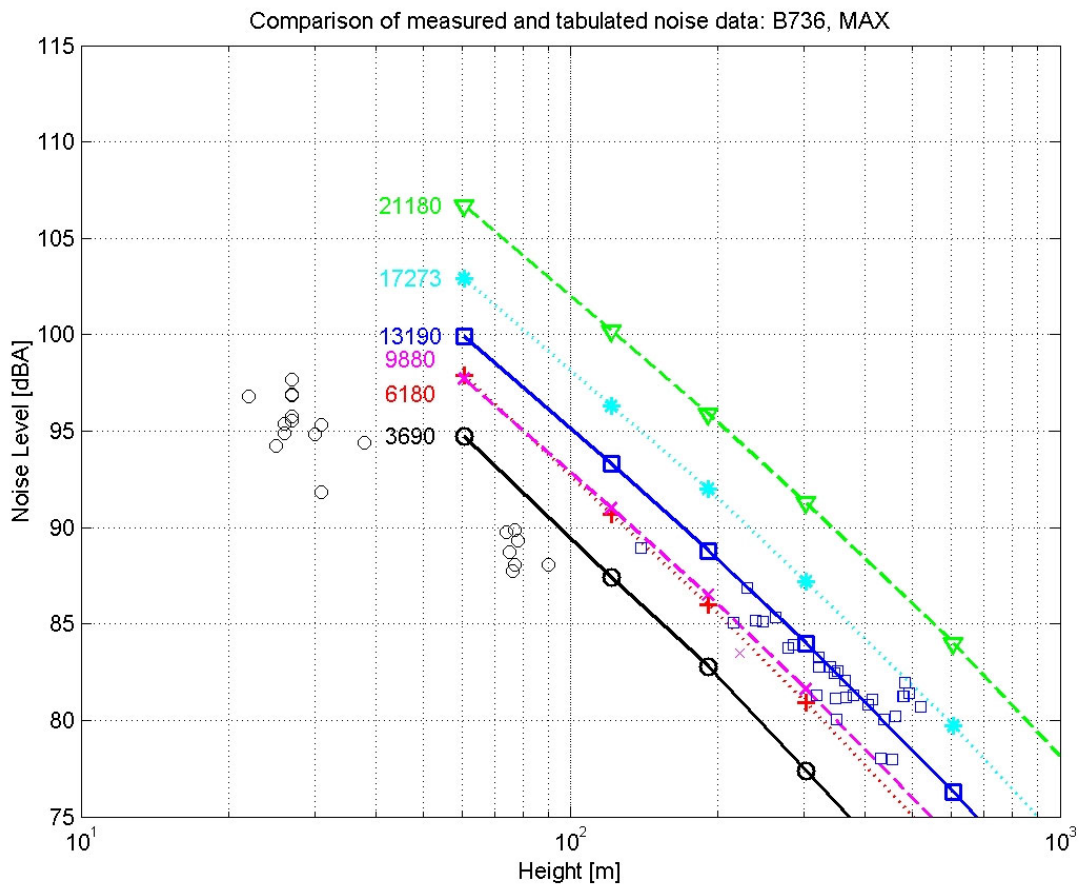
In the figures, the thrust levels of the NORTIM curves are annotated along the curves.

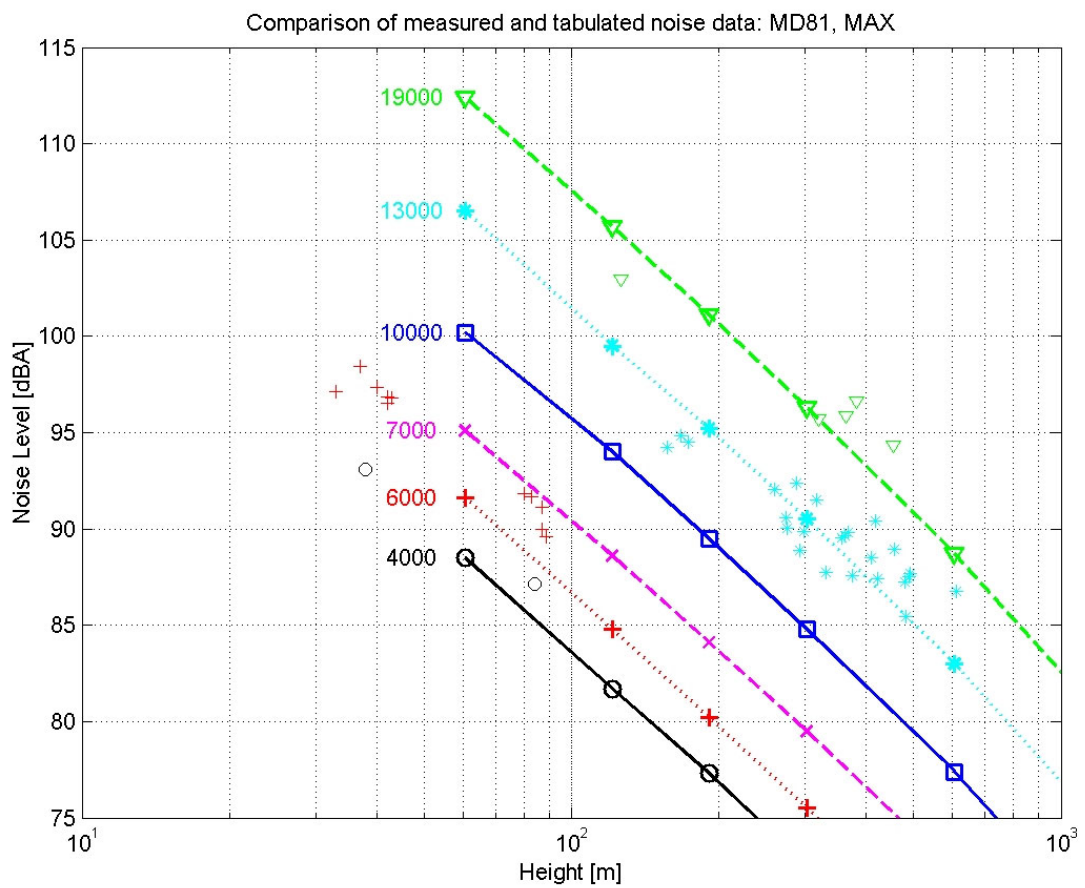
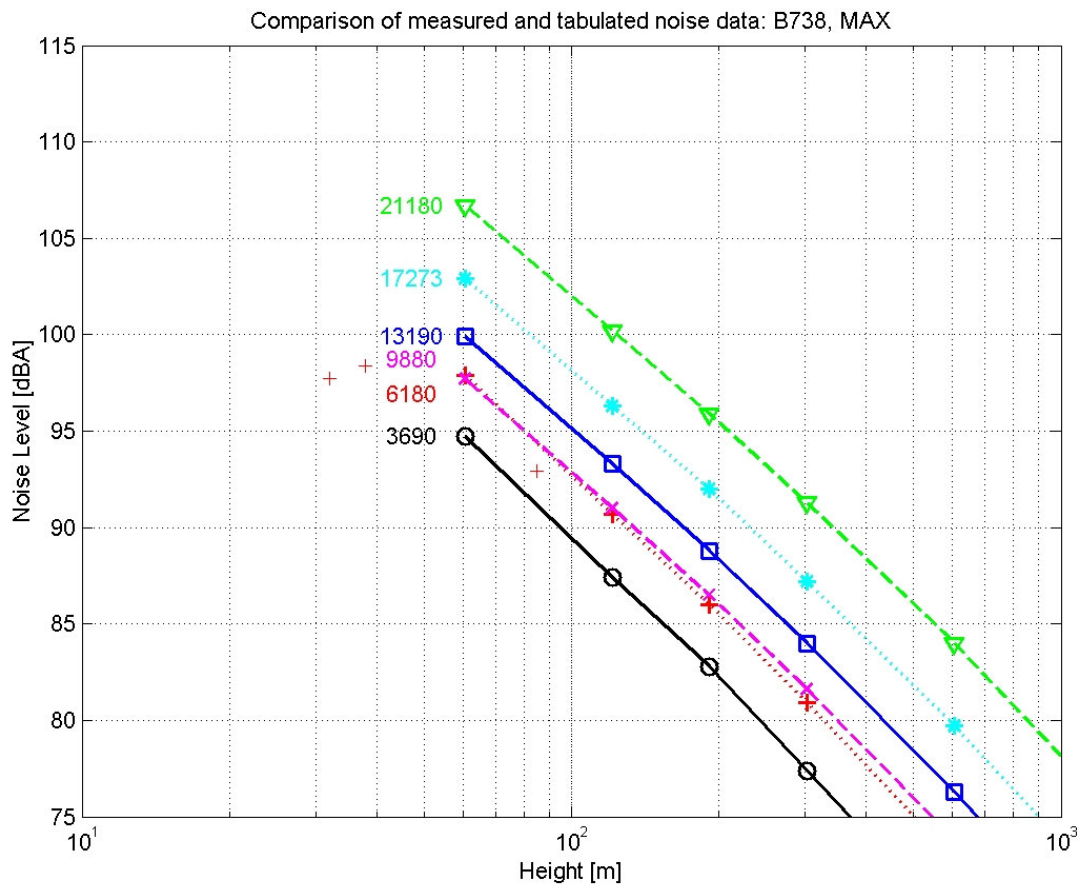


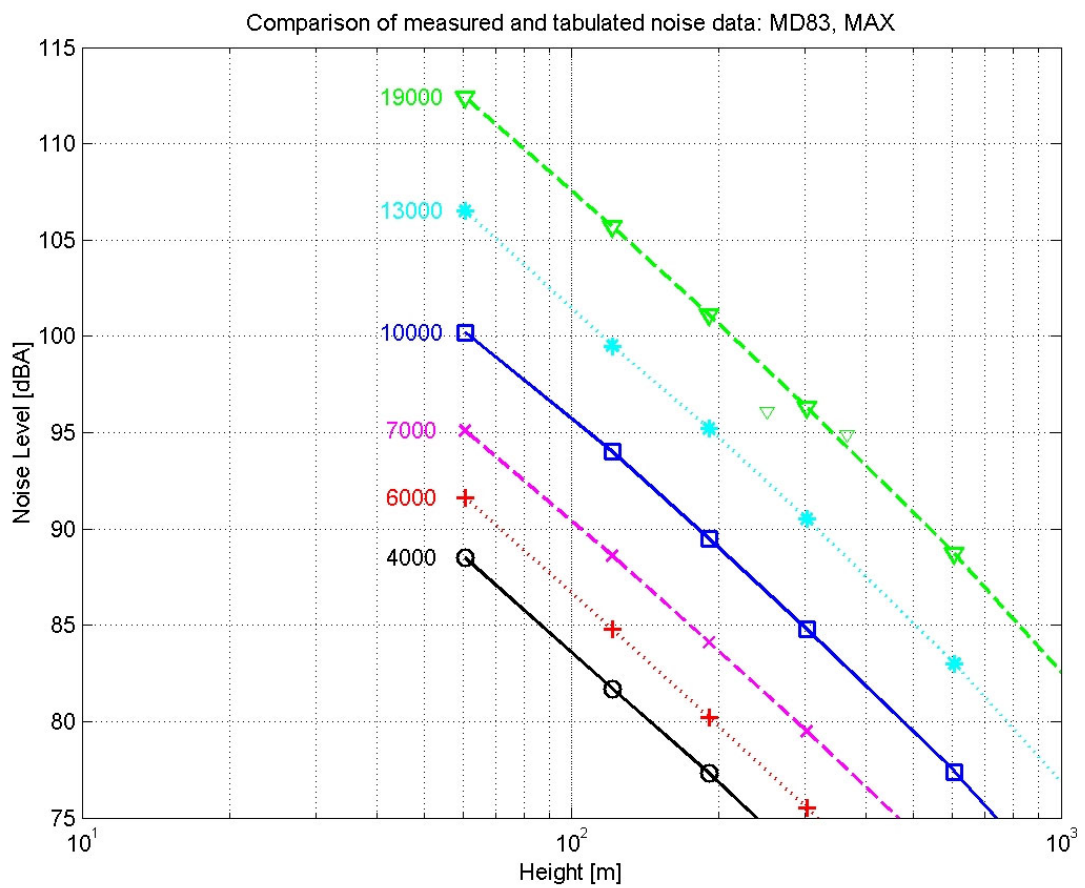
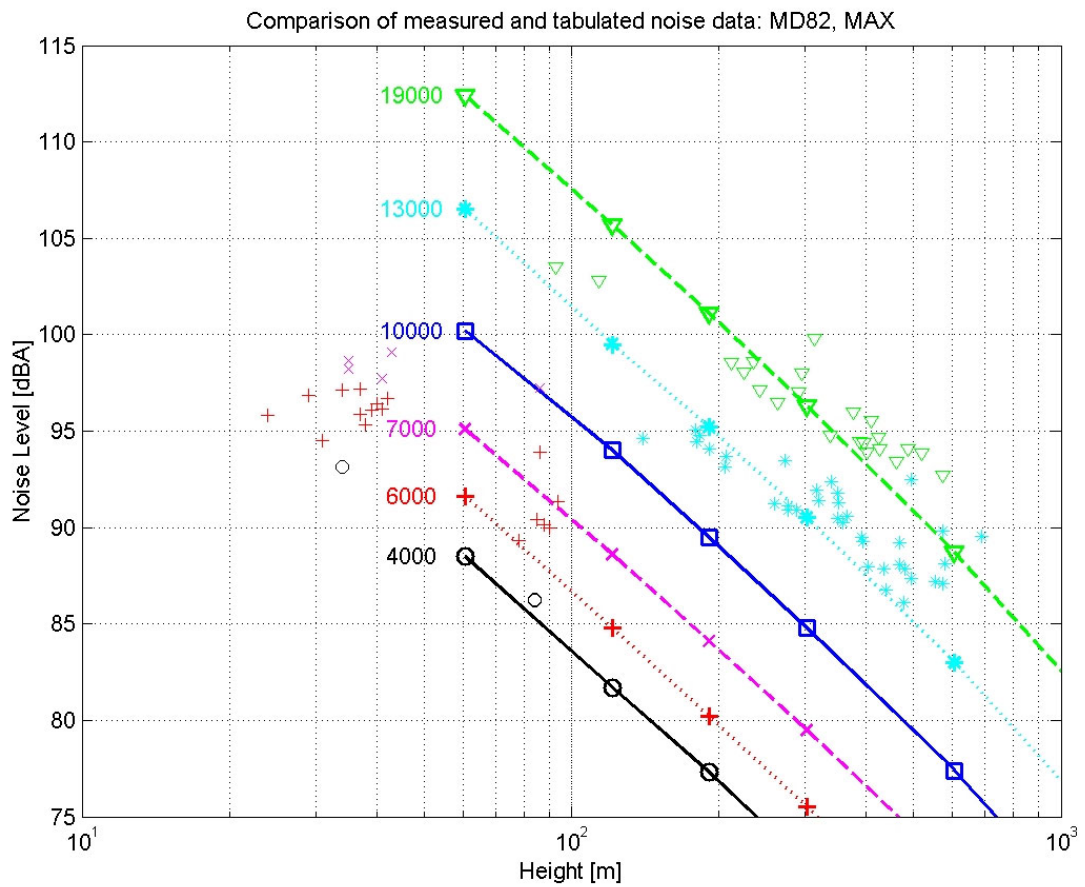


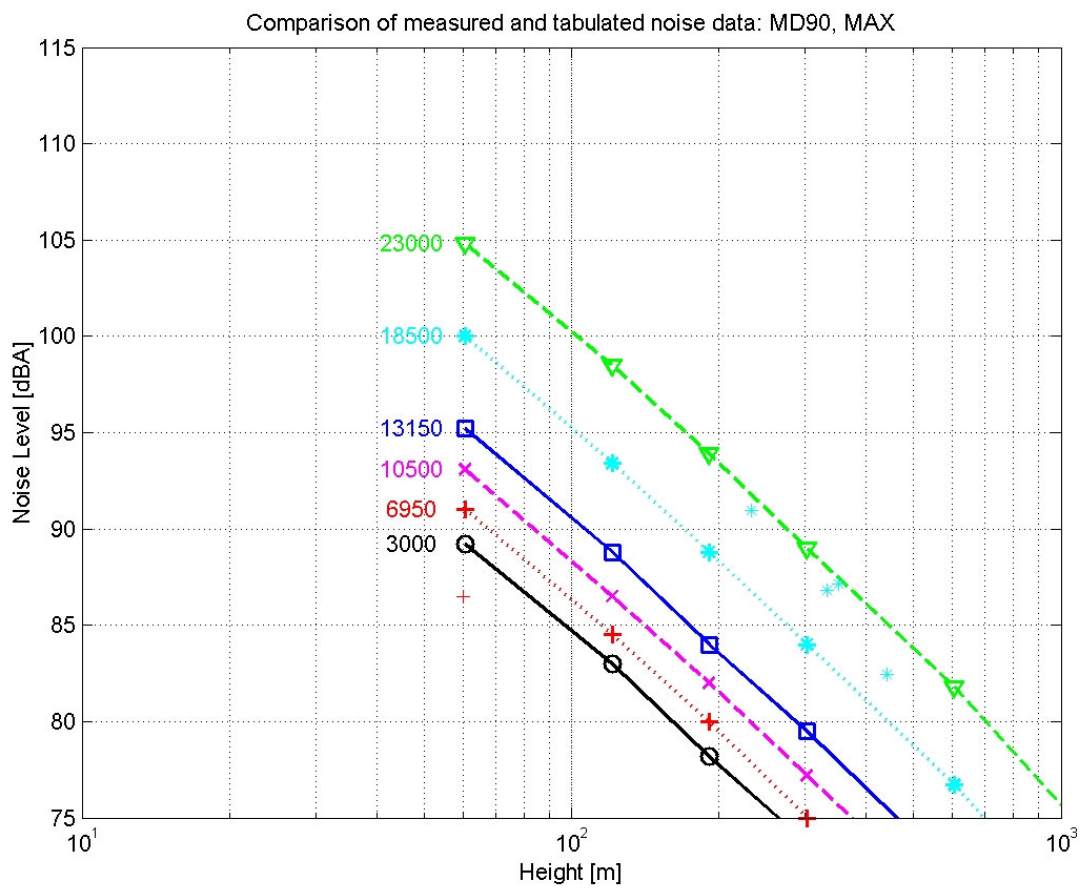
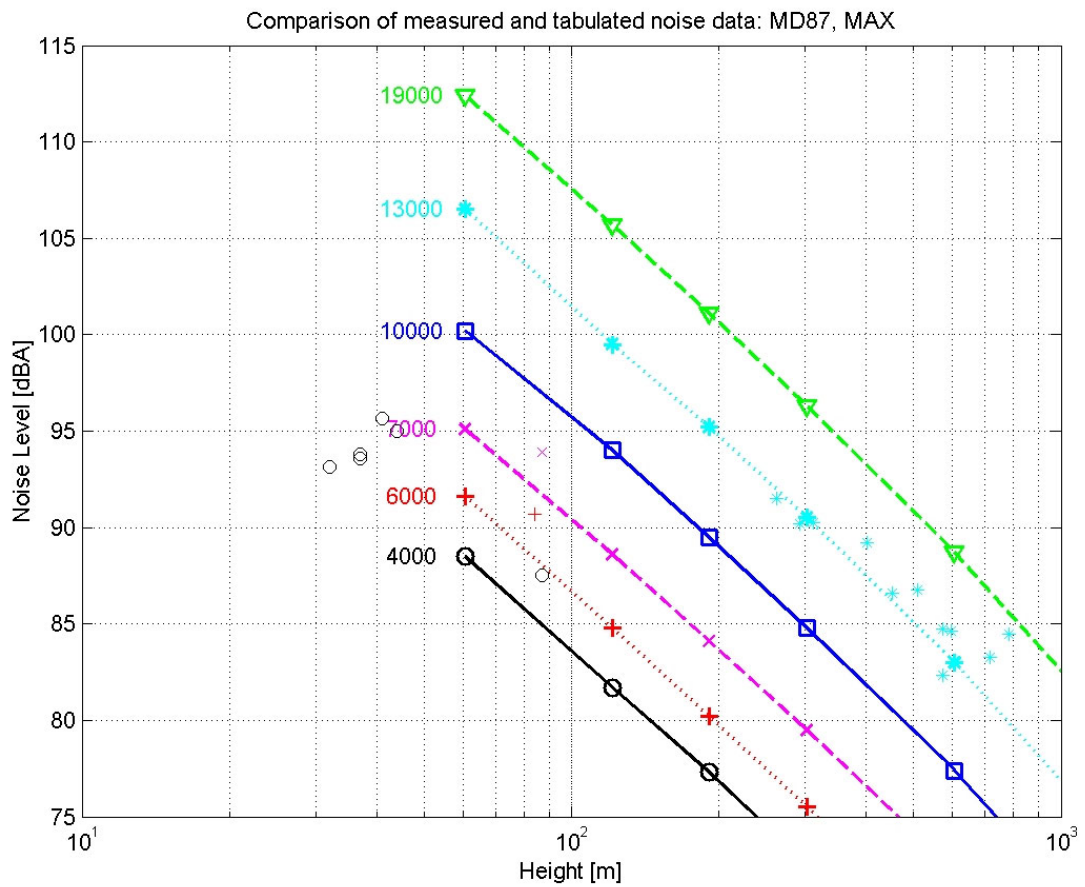












3 Statistical analysis

The deviations between the NPD curves from the database and the normalized data have been analyzed and the statistics are given in the following tables: one for SEL values, one for LAMAX values. The number of observations, mean value, standard deviation and limits for the 95% Confidence Interval are shown for each aircraft and operation.

A positive mean value suggests that the database NPD curves give too high noise value.

Table 1 Statistical analysis of the SEL values

Type	Operation	No of Obs	Mean	St.dev	CI_low	CI_high
B736	LA	20	4.1	1.6	3.4	4.9
B737	LA	22	3.8	1.4	3.1	4.4
B738	LA	3	1.4*	2.1	-3.8	6.6
MD81	LA	13	-2.6	0.7	-3	-2.2
MD82	LA	25	-1.6	1.6	-2.3	-1
MD87	LA	8	-2.4	1.4	-3.5	-1.2
MD90	LA	2	8.9*	6.5	-49.5	67.2
B736	TO	31	-0.9	1.2	-1.4	-0.5
B737	TO	36	-0.8	1.8	-1.4	-0.2
MD81	TO	29	-0.8	1.1	-1.3	-0.4
MD82	TO	58	-1.4	1.5	-1.8	-1
MD83	TO	2	0.1*	1.6	-14.5	14.8
MD87	TO	11	-1.1	1.2	-1.9	-0.3
MD90	TO	4	-2	1	-3.5	-0.5

* not significant

Table 2 Statistical analysis of the LAMAX values

Type	Operation	No of Obs	Mean	St.dev	CI_low	CI_high
B736	LA	20	6	2.5	4.9	7.2
B737	LA	22	6.3	2.6	5.1	7.4
B738	LA	3	4.2*	2.7	-2.4	10.8
MD81	LA	13	-1.8	1.1	-2.4	-1.1
MD82	LA	25	-0.4*	2.5	-1.5	0.6
MD87	LA	8	-1.6	1.8	-3.1	-0.1
MD90	LA	2	12.3*	10.9	-85.9	110.5
B736	TO	31	0.2*	1.6	-0.4	0.8
B737	TO	36	0.4*	2	-0.3	1.1
MD81	TO	29	-0.5*	1.9	-1.2	0.2
MD82	TO	58	-1.2	2.4	-1.8	-0.6
MD83	TO	2	0.7*	2	-17.1	18.6
MD87	TO	11	-1*	1.6	-2.1	0.1
MD90	TO	4	-3.8	1	-5.4	-2.2

* not significant