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**A 10-year statistics of sonic boom carpets based on meteorological ERA data and numerical calculations**

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In the framework of the Sonic Boom European Research Programme (SOBER) financed by the EU, the propagation of a (primary) sonic-boom emerging from a high-flying aircraft has been investigated. A statistical analysis of the meteorological variability and its influence on the sonic boom characteristics, i.e. the sound immission on the ground, has been carried out. The investigations are based on a full ten-year set of ERA-15 data (years 1984 to 1993) of an area in the St.George's Channel. The sonic boom propagation has been calculated using an advanced ray-tracing algorithm. The large amount of data has been reduced to shape parameter which have been analysed using e.g. frequency distributions, cross correlations, and cluster analysis. The frequency distributions of the meteorological data show no significant variation with respect to the daytime and only a few significant variations with respect to the season. The correlation of the acoustic and the meteorological parameters show the specific influence of several meteorological parameter on the sonic boom. A classification of the meteorological data has been carried out in order to be able to represent the whole sonic boom statistics by means of a few data sets.

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