A boundary element model to calculate HRTFs. Comparison between calculated and measured data

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Head-related transfer functions (HRTFs) play an important role in spatial sound perception. With the boundary element method (BEM) it is possible to numerically calculate these functions. As a rule of thumb six BEM elements per wavelength should be used, thus it is necessary to have very fine meshes when calculating HRTFs at high frequencies. In that case, the solution of the linear system of equations generated by the BEM needs a lot of computing time and memory. Advanced algorithms like the fast multipole method (FMM) speed up calculations and reduce memory requirements which allows a computation of HRTFs even for frequencies as high as 20 kHz in feasible time.

In this work we give a short overview of a BEM model coupled with the FMM. We present calculated results for several persons and compare the results with measured data of these persons.