

1023-65-166

**Timo Betcke\*** ([t.betcke@tu-bs.de](mailto:t.betcke@tu-bs.de)), Institut Computational Mathematics, TU Braunschweig, Pockelsstr. 14, 38106 Braunschweig, Germany. *The quality of approximation bases for the Helmholtz equation*. Preliminary report.

A popular tool for the solution of problems involving the Helmholtz equation are boundary collocation methods, where the solution is approximated from a space of functions that satisfy the Helmholtz equation but not necessarily the boundary conditions. An important question in these methods is the right choice of basis functions. While often the main consideration is to achieve good approximation theoretic convergence estimates of a basis set it is equally important to investigate the conditioning of approximate solutions towards a certain basis. This leads to bounds on the quality of a solution in finite precision arithmetic. We will give results to this effects and show several examples involving boundary value and eigenvalue problems. (Received August 17, 2006)