

Preconditioning in collocation and interpolation with radial basis functions

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The collocation method and the interpolation problem with radial basis functions usually produce large and dense linear systems with bad conditioned coefficients matrices. We consider the solution of these linear systems by iterative methods. A translation technique based on Rokhlin's fast multipole method [1] has been used to speed up the action of the coefficients matrix on a given vector.

In order to improve the efficiency of these iterative methods a preconditioning matrix is necessary [2]. We study preconditioning techniques that can be efficiently used to solve this kind of linear systems.

Joint work with N. Egidi, P. Maponi, A. Perticarini

References

- [1] L. GREENGARD AND V. ROKHLIN, *A fast algorithm for particle simulations*, Journal of Computational Physics, 73 (1987), pp. 325–348.
- [2] N. EGIDI AND P. MAPONI, *Preconditioning techniques for the iterative solution of scattering problems*, Journal of Computational and Applied Mathematics, 218 (2008), pp. 229–237.