Proceedings of CHT-17
ICHMT International Symposium on Advances in Computational Heat Transfer

May 28-June 1, 2017, Napoli, Italy

CHT-17-124

NUMERICAL SOLUTION OF HEAT CONDUCTION PROBLEMS BY MEANS OF A MESHLESS METHOD WITH PROPER POINT DISTRIBUTIONS

Riccardo Zamolo[§], Enrico Nobile
Dipartimento di Ingegneria e Architettura, Università degli studi di Trieste,
via A. Valerio 10, 34127 Trieste, Italy
[§]Correspondence author. Email: riccardo.zamolo@phd.units.it

FINAL ABSTRACT

A meshless method based on Radial Basis Function (RBF) interpolation and direct collocation is used to systematically solve steady state heat conduction problems on several 2D domains with different boundary conditions. The point sets, or distributions, needed by the method have been generated using two techniques: a relaxed quadtree technique and a high quality, geometry dependent, technique. The resulting solutions are then compared to the corresponding analytical solutions; FEM (Finite Element Method) solutions have also been computed as reference.
These tests showed good convergence properties (II or IV order) for many of the considered cases, with an error of the same order of magnitude of classical FEM solutions, while a limited number of cases showed fluctuating convergence curves. These features confirm that this numerical approach could be an effective technique in the numerical simulation of practical heat conduction problems.