

LEAST-SQUARES COLLOCATION AND LAGRANGE MULTIPLIER METHODS FOR TAYLOR MESHLESS METHOD

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Key words: *Taylor series; Meshless; Least-square; Lagrange multiplier; Piecewise resolution.*

A recently proposed meshless method is discussed in this paper. It relies on Taylor series, the shape function being high degree polynomials deduced from the Partial Differential Equation (PDE). In this framework, an efficient technique to couple several polynomial approximations has been presented in [1]: the boundary conditions were applied by using the least-square collocation and the interface was coupled by a bridging technique based on Lagrange multipliers. However, the method would be easier to be handled if a common technique could be applied for both boundary and interface conditions. Therefore, we aim to introduce a common technique to account for boundary and interface conditions. Several numerical techniques have been investigated and the results show that the least-square method applied for both boundary and interface conditions in piecewise resolution is more robust and easier to deal with than Lagrange multipliers method.

REFERENCES

- [1] Y. Tampango, M. Potier-Ferry, Y. Koutsawa and S. Tiem. Coupling of polynomial approximations with application to a boundary meshless method. *International Journal for Numerical Methods in Engineering.*, Vol. **95**, 1094–1112, 2013.