A New Computational Package for Using in CFD and Other Problems (Third Edition)

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Abstract : This paper shows changes done to the Reduced Finite Element Method (RFEM) that its result will be the most powerful numerical method that has been proposed so far (some forms of this method are so powerful that they can approximate the most complex equations simply Laplace equation!). Finite Element Method (FEM) is a powerful numerical method that has been used successfully for the solution of the existing problems in various scientific and engineering fields such as its application in CFD. Many algorithms have been expressed based on FEM, but none have been used in popular CFD software. In this section, full monopoly is according to Finite Volume Method (FVM) due to better efficiency and adaptability with the physics of problems in comparison with FEM. It doesn't seem that FEM could compete with FVM unless it was fundamentally changed. This paper shows those changes and its result will be a powerful method that has much better performance in all subjects in comparison with FVM and another computational method. This method is not to compete with the finite volume method but to replace it.

Keywords : reduced finite element method, new computational package, new finite element formulation, new higher-order form, new isogeometric analysis

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