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HIGH ORDER FINITE ELEMENT METHOD ON THE IBM POWER SYSTEMS HIGH PERFORMANCE COMPUTING APPLIED ON STRUCTURAL MECHANICS

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The goal of this project is the development of new computational techniques to improve the performance of High Order Finite Element Method (HO-FEM) when applied to transient dynamic nonlinear solid mechanics problems. We intend to develop high performance algorithms to the HO-FEM on hybrid computing architectures. The algorithms will be tested on the IBM Blue Gene supercomputer, available at the Argonne National Laboratory (ANL). The relevance of the project is the scalability lack of the HO-FEM software on supercomputers. This limitation may be handled using the local algorithms developed by the research group, which allow the use of p-non-uniform discretization in a simple way. The developed software will make public available to the interested Brazilian and foreign scientific research communities.

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