

## ON THE REDUCTION OF SOLID DYNAMICS EQUATIONS AND THEIR REAL-TIME DIRECT INTEGRATION

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**Abstract.** In this work we propose a particular form of the solid dynamics equations in a multidimensional framework. This particular viewpoint of the traditional dynamics equations is then discretized and solved by PGD approximations very efficiently.

As a result, the method here proposed provides with a meta-model or surface response of the system subjected to any type of force (taking values in a given interval) and for any initial boundary conditions. Since the time interval in which the integration is performed can be virtually any, and any integration scheme can be used, the proposed method, combined with an on-line/off-line strategy, provides with a sort of “black box” that computes the response of the system for apparently very large time intervals with great accuracy and under real time requirements.

Several aspects will be studied, such as the parameterization of the space of initial conditions, efficiency issues and others, together with examples showing the potential of the proposed technique.

Special attention will be paid to the issue of choosing the appropriate time step, the number of modes, strategies for optimal balance between accuracy and speed of simulation, etc.