On selective filtering of hourglass instability modes in lagrangian hydrodynamics.

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One usual problem occuring in numerical computations of inviscid flows in the conflict between artificial dissipation due to numerical algorithms and its opposite, the dispersion associated, for instance, with 2nd order accuracy scheme.

This fact is particularly important in lagrangian simulations where the action of these properties is intrinsic with regards to the scheme, the grid structure, the boundary shape and the kinematic of the flow.

Dealing with physical problems admitting thresholds and requiring a high level of convergence, it is of tremendous importance to be able to control numerical instabilities.

We propose a selective algorithm devoted to damp short wave lengths and to preserve resolved physical waves and their kinetic energy.