A 3D Finite Volume Lagrangian scheme

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In a recent work, a new Finite Volume Lagrangian scheme has been presented in 2D (see B. D. and C. Mazeran, ARMA, 2006). All unknowns are cell centered. Total energy is conserved. Cell centered schemes are attractive for ALE techniques.

We will present the 3D generalisation on arbitrary meshes. The construction is based on some compatibility assumption which helps to have an algebraic presentation of the scheme. This algebraic construction encompasses all the desired geometrical properties, but in a more abstract framework.

We will show 3D tests cases which demonstrate the efficiency of this approach, even near singular 3D points.