A novel finite element framework for numerical simulation of fluidization processes and multiphase granular flow\textsuperscript{1} JAMES PERCIVAL, ZHIHUA XIE, DIMITRIOS PAVLIDIS, Imperial College London, JEFFERSON GOMES, University of Aberdeen, CHRISTOPHER PAIN, OMAR MATAR, Imperial College London — We present results from a new formulation of a numerical model for direct simulation of bed fluidization and multiphase granular flow. The model is based on a consistent application of continuous-discontinuous mixed control volume finite element methods applied to fully unstructured meshes. The unstructured mesh framework allows for both a mesh adaptive capability, modifying the computational geometry in order to bound the error in the numerical solution while maximizing computational efficiency, and a simple scripting interface embedded in the model which allows fast prototyping of correlation models and parameterizations in intercomparison experiments. The model is applied to standard test problems for fluidized beds.

\textsuperscript{1}EPSRC Programme Grant EP/K003976/1

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Date submitted: 30 Jul 2013

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