An automatic ordering method for eulerian multi-materials schemes

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Eulerian schemes for multi-materials compressible flows have proved their efficiency, especially when materials have to stand high deformations. One of the main issues remains in their dealing with the so-called mixed cells, that is, cells in which several materials are present. In the Volume of Fluid (VOF) context, selected for conservative property, many high precision methods for interface reconstruction have been designed for two materials flows. However when it comes to simulations with a greater number of materials, a lot of them appear unfitted. In our case, a Piecewise Linear Interface Calculation (PLIC) approach was chosen, but in cells where three or more materials are coexisting, finding their relative positions with one another is not straightforward. The method we present here, related to Mosso and Clancy's (1994), orders the materials in each mixed cell thanks to approximated centroids. We will give details of the method and some results on a few simple examples.