CFD simulation of some physical separation processes in mineral processing

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Abstract

Mineral processing involves processing of ore to upgrade and recover mineral or metal values from the ore. Most of these processes involve physical concentration of the mineral i.e. there is no change in the chemical nature of the mineral. As water is the preferred medium for processing, study of the dynamics of the solids and well as the liquid is of importance in the design and operation of a these mineral processing units. Computational fluid dynamic simulation for some of the mineral processing units such as high intensity magnetic separator, hydrocyclone and a spiral concentrator have been carried out. Three-dimensional multi-phase systems were considered treating both the solids as well as the liquid as continuum (i.e. Eulerian-Eulerian model). Some experimental validation has been made which agree well with theoretical prediction