

## A BEM Model for Heat Flux Exchange between Particles and Fluid

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**Abstract** - This study is concerned with the problem of two-way coupled simulations of multiphase flows within an Eulerian-Lagrange framework. For a point-wise particles the standard method to introduce the Lagrangian particles as sources into the Eulerian mesh is the particle-in-cell (PIC) method. In this study, we present a boundary element method (BEM) model instead and show that the novel BEM model gives superior results when particles are not located close to the mesh nodes. We introduce a critical distance from the mesh node, which separates the domain volume, where the BEM model can be used and the volume, where the PIC model should be used. The results show that the BEM model can be used in about 90% - 99% of the volume depending on the mesh used.

**Keywords:** Boundary element method, particle-in-cell, critical distance, point-wise particles.