

Abstract Submitted  
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**Computational model and simulations of gas-liquid-solid three-phase interactions**<sup>1</sup> LUCY ZHANG, CHU WANG, Rensselaer Polytechnic Institute — A computational technique to model three-phase (gas-liquid-solid) interactions is proposed in this study. This numerical algorithm couples a connectivity-free front-tracking method that treats gas-liquid multi-fluid interface to the immersed finite element method that treats fully-coupled fluid-solid interactions. The numerical framework is based on a non-boundary-fitted meshing technique where the background grid is fixed where no mesh-updating or re-meshing is required. An indicator function is used to identify the gas from the liquid, and the fluid (gas or liquid) from the solid. Several 2-D and 3-D validation cases are demonstrated to show the accuracy and the robustness of the method.

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