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**Fluid Dynamics and Transport Phenomena****Numerical simulation of stirred tanks using a hybrid immersed-boundary method\*****Shengbin Di(狄升斌)<sup>1,2</sup>, Ji Xu(徐骥)<sup>1</sup>, Qi Chang(常麒)<sup>1,3</sup>, Wei Ge(葛蔚)<sup>1,\*\*</sup>**

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**ABSTRACT** Conventionally, multiple reference frame (MRF) method and sliding mesh (SM) method are used in the simulation of stirred tanks, however, both methods have limitations. In this study, a hybrid immersed-boundary (IB) technique is developed in a finite difference context for the numerical simulation of stirred tanks. IBs based on Lagrangian markers and solid volume fractions are used for moving and stationary boundaries, respectively, to achieve optimal efficiency and accuracy. To cope with the high computational cost in the simulation of stirred tanks, the technique is implemented on computers with hybrid architecture where central processing units (CPUs) and graphics processing units (GPUs) are used together. The accuracy and efficiency of the present technique are first demonstrated in a relatively simple case, and then the technique is applied to the simulation of turbulent flow in a Rushton stirred tank with large eddy simulation (LES). Finally the

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