

A Partition of Unity Based Method for Moving Interface and Free Boundary Problems

***Wenjun Ying**

¹ Department of Mathematics and Institute of Natural Sciences, Shanghai Jiao Tong University, China

*Corresponding author: WYING@SJTU.EDU.CN

In this talk, I will introduce a recently proposed structured grid method for moving interface and free boundary problems. That the method is a structured grid method is not just because the domain is covered by a larger regular box and the box is partitioned into a Cartesian grid but also because the boundary or the interface is partitioned into overlapping patches which are represented by locally uniform grid points. The partition of the boundary or interface into locally uniform patches is done by the technique of partition of unity (POU). I will also talk about the kernel-free boundary integral method for elliptic PDEs on the structured volume and boundary grids. Numerical examples for some typical moving interface and free boundary problems such as the Stefan problem and the mean-curvature flow will be presented to demonstrate the efficiency and accuracy of the method.

Keywords: moving interface, free boundary, structured grid, partition of unity