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**Xu Zhang\*** ([xuz@vt.edu](mailto:xuz@vt.edu)), 460 McBryde Hall, Virginia Tech, Blacksburg, VA 24061. *Solving Planar Elasticity Interface Problems with Cartesian Meshes.*

In the presentation, we will discuss new immersed finite element (IFE) methods for solving the planar elasticity interface problems with Cartesian meshes. Solution meshes in these IFE methods do not need to fit the material interfaces, which can be embedded in the interior of some elements. The IFE basis functions are constructed by incorporating the elastic interface jump conditions. Basic features of these IFE functions and IFE spaces will be discussed. Numerical examples will be provided to demonstrate that these IFE functions maintain the optimal approximation capability, and the IFE solutions for the elasticity interface problem have optimal convergence rates in both energy norm and  $L^2$  norm. (Received September 13, 2012)