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**Derivation of jump conditions for the immersed interface method with a triangular mesh of an interface** GLEN PEARSON, SHENG XU, Southern Methodist University — The immersed interface method is an accurate and efficient Cartesian grid method for solving interface problems. The key idea of the method is to incorporate necessary interface-induced jump conditions into numerical schemes. In this talk, we present an approach to derive the necessary Cartesian jump conditions for the immersed interface method to solve Poisson equations subject to sharp interfaces in 3D. The approach is based on triangular mesh representation of an interface and can easily handle a non-smooth complex interface. We test this approach on Poisson problems with sharp interfaces shaped as spheres, cubes, cylinders and cones. Our results demonstrate second-order accuracy in the infinity norm.

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