1135-65-1291 **Hengguang Li*** (li@wayne.edu), Detroit, MI 48202. *Finite Element Approximations of Singular Solutions in W_p^1.*

We discuss recent advances in the development of effective finite element algorithms approximating a class of singular solutions, including corner singularities with different boundary conditions and singularities from the non-smooth points on the interface in transmission problems. Based on a-priori estimates in weighted function spaces, we propose and investigate effective finite element methods approximating singular solutions in the energy and relevant Banach spaces. (Received September 21, 2017)