# LOCAL APPROXIMATION ERROR FOR GENERALIZED FEM FOR PROBLEMS WITH DISCONTINUOUS COEFFICIENTS

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## ABSTRACT

We consider generalized finite element methods based on partitions of unity [1], [2], and [3]. Here the standard FEM approximation is enriched through the solutions of local boundary value problems. In this treatment we consider the generalized p-FEM for problems with discontinuous coefficients and analyze the local approximation error. We focus on the local problem for two-phase composites and examine the approximation error when there is uncertainty in the coefficients of the PDE. For this case the coefficient matrix is isotropic and takes on two values. Here it is supposed that we only know the volumes of the sets where the coefficient matrix takes on each of its values inside the local domain. We provide a methodology for numerically estimating the worst case scenario for the error as a function of the buffer size and p, see [4].

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