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Numerical methods for high-contrast multiscale problems

In this talk, we review the design and analysis of robust domain decomposition and multiscale finite element algorithms for high-contrast multiscale problems. In particular, we review the construction of coarse spaces using spectral information of local bilinear forms. We present some applications to linear and nonlinear problems including a novel conservative discretization for two-phase flow in high-contrast multiscale porous media.