

Improved interface condition for 2D Domain Decomposition with corner

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We present a local improvement of domain decomposition methods for two-dimensional elliptic problems for which either the geometry or the domain decomposition presents conical singularities. The problem reduces to determining the coefficients of some transmission boundary conditions to obtain fast convergence of domain decomposition methods. Specific problems occur in the presence of conical singularities. Starting from the method used for regular interfaces, we derive a local improvement by matching the singularities, that is the first terms of the asymptotic expansion around the corner, provided by Kondratiev theory. This theoretical approach leads to the explicit computation of some coefficients in the interface boundary conditions, to be tested numerically.