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Scientific Computing Seminar

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Multilevel preconditioners for symmetric and unsymmetric M-matrices

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Abstract: In this talk, we present algebraic multilevel preconditioners for M-matrices, such as those arising from finite-volume discretizations of anisotropic highly heterogeneous diffusion-reaction or convection-diffusion-reaction problems. The necessary requirement for matrices is to be strictly diagonally dominant. The preconditioners are based on rules for dropping of off-diagonal matrix entries combined with Schur complement techniques. Several parameters can be used to regulate the convergence ratio of the resulting preconditioned iterative methods. Numerical results are given to demonstrate performance of the methods.