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**Analysis Of an Aggregation-Based Algebraic Multigrid
Methods On Matrices Related to a 1D Model Problem**

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We show that a pairwise aggregation-based algebraic 2-grid method, applied to the linear system $Ax = b$ arising from a 1D model problem for Poisson's equation with Dirichlet boundary conditions, reduces the A -norm of the error at each step by at least the factor $\sqrt{5/8}$. We then generalize this result to problems with the same eigenvectors but different eigenvalues from the model problem, and also to problems with different eigenvectors that are especially well-suited to the method. Finally, we discuss the reduction in the A -norm of the error when the 2-grid method is replaced by a multigrid V-cycle and indicate that conjugate gradient acceleration is required in order to improve the degraded performance of multigrid V-cycle.