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A new look at interpolation in root-node smoothed aggregation

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Currently, interpolation operators, P, in root-node smoothed aggregation are formed through an energy minimization process over the columns of P. Constraining P to exactly interpolate known near null-space candidate(s) is a row-wise constraint, which together leads to an expensive, global minimization process. In this talk, a new method to form P is proposed by minimizing the L^2 error in interpolation. When combined with near null-space constraints, the result is a local minimization process for each row of P. A theoretical framework and two-level results are discussed, motivating the next steps in achieving convergence rates of current root-node at a much lower cost.