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Local Improvement Results for Anderson Acceleration and Inaccurate Function Evaluations

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We analyze the convergence of Anderson acceleration when the fixed point map is corrupted with errors. We consider uniformly bounded errors and stochastic errors with infinite tails. We prove local improvement results which describe the performance of the iteration up to the point where the accuracy of the function evaluation causes the iteration to stagnate. We illustrate the results with examples from neutronics.