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Simon Tavener* (simon.tavener@colostate.edu), Department of Mathematics, Colorado State University, Fort Collins, CO 80523, and **Jehanzeb Chaudhry** and **Don Estep**. *A posteriori error analysis for domain decomposition.*

Domain decomposition methods are widely used for the numerical solution of partial differential equations on parallel computers. We develop an adjoint-based *a posteriori* error analysis for overlapping multiplicative Schwarz domain decomposition and for overlapping additive Schwarz. In both cases the numerical error in a user-specified functional of the solution (quantity of interest), is decomposed into a component that arises as a result of the finite iteration between the subdomains, and a component that is due to the spatial discretization. The spatial discretization error can be further decomposed in to the errors arising on each subdomain. This decomposition of the total error can then be used as part of a two-stage approach to construct a solution strategy that efficiently reduces the error in the quantity of interest. (Received August 29, 2019)