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Convergence analysis of mixed finite element approximations to shape gradients in the Stokes equation

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Highlights

- We present convergence analysis with a priori error estimates for both the volume and boundary formulations of approximate shape gradients associated with the Stokes equation.
- The standard MINI and Taylor-Hood elements are employed to discretize the Stokes equation, its possible adjoint, and the resulting shape gradients.
- The theoretical analysis as well as numerical comparisons show that the volume integral formula has superconvergence property and offers better accuracy.

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