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Inexact Newton dogleg methods

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The dogleg method is a classical trust-region technique for globalizing Newton's method. While it is widely used in optimization, including large-scale optimization via truncated-Newton approaches, its implementation in general Newton-Krylov methods or other Newton-iterative methods can be problematic. In this talk, we first outline a dogleg method suitable for the general inexact Newton context and provide a global convergence analysis for it. We then discuss certain issues that may arise with standard dogleg implementation strategies and propose modified strategies that avoid them. We conclude with a report on numerical experiments involving benchmark CFD problems.