
C. T. Kelley
**Multilevel and Newton-Krylov Methods for Some
Parameter-Dependent Compact Fixed Point Problems**

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In this talk we discuss aspects of two algorithms for a class of parameter-dependent compact fixed point problems. If the compactness is a result of the use of a short-time temporal integration as a nonlinear preconditioner, we show how the rate of convergence of the linear iteration in a Newton-Krylov method is related to the dimension of the inertial manifold. We then discuss some observations on construction of multilevel methods that accurately resolve turning points and asymptotes for such problems.