Bifurcation analysis software for large-scale and parallel applications with LOCA

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Abstract

LOCA is research software for performing continuation and bifurcation analysis of large-scale applications on distributed-memory parallel computers. LOCA is written in C++ and is a package of the larger Trilinos Parallel Solver Framework, developed at Sandia National Labs. It makes extensive use of many other Trilinos packages including the nonlinear solver, distributed-memory parallel data structures, preconditioners, linear solvers, and an iterative eigensolver. With these algorithms, it is possible to perform bifurcation analysis of 2D, 3D, and even 4D discretizations of PDES. Using LOCA requires a proficiency in C++. It does not include any graphical output.

Joint work with Eric Phipps (Sandia National Laboratories).