Applications of the ArbiTER edge plasma eigenvalue code D.A.
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Livermore National Laboratory — ArbiTER is a flexible eigenvalue code designed
for plasma physics applications. This code uses an equation and topology parser to
determine how a particular set of linearized model equations is spatially discretized.
The resulting matrix form is then solved using the SLEPc [1] eigensolver package.
The equation and topology parsers permit a wide variety of capabilities, including
variable numbers of dimensions, both finite difference and finite element methods,
and irregular boundary conditions. Recent upgrades also permit parallel operation
and the solution of source-driven problems. Two applications of this code will be
presented, both as demonstrations of capability and as benchmark cases. One of
these is the calculation of resistive ballooning modes with fully kinetic electrons.
This will demonstrate the capacity for solving kinetic problems. The other is the use
of extended spatial domains for ballooning stability analysis. This will demonstrate
the utility of extra dimensions in calculations with fluid models. Work supported
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[1] http://www.grycap.upv.es/slepc/

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