

VALIDATION OF CODIMENSION 2 BIFURCATIONS IN DDES

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Arc-length continuation is well suited to follow 1 dimensional curves and has been successfully coupled with the radii polynomial approach to validate solutions to parameter dependent problems. In this talk, we discuss algorithms to follow 2-dimensional manifolds originated by problems with multiple parameters. Then, we couple this numerical method with a broader formulation of the radii polynomials to allow for the validation of this computed manifold. In particular, we look at ODEs and DDEs that undergo codimension 2 bifurcations of the saddle-node and Bautin type. To study these systems we apply a global blow up and track both the periodic orbits and the fixed points in a neighbourhood of the codim2 bifurcation.

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