

MINI-CONFERENCE
*Path Following and Boundary Value Problems:
A Continuing Influence in Dynamics*
on the occasion of Eusebius Doedel's 60th birthday
July 6–7, 2007

Continuation of point-to-cycle connections in 3D ODEs

Yuri A. Kuznetsov
*Department of Mathematics
Utrecht University
Budapestlaan 6
Utrecht, 3508 TA
THE NETHERLANDS*
kuznet@math.uu.nl

Abstract

New methods for the numerical continuation of point-to-cycle connecting orbits in three-dimensional autonomous smooth ODEs are proposed. In our approach, the projection boundary conditions near the cycle are formulated using the eigenfunctions of the associated adjoint variational operator, avoiding the computation of the monodromy matrix. The equations for the eigenfunction are included in the defining boundary-value problem, allowing a straightforward implementation in AUTO, in which only the standard features of the software are employed. Homotopy methods to find an initial connecting orbit will be discussed and illustrated by examples.

*Joint work with Eusebius J. Doedel (Concordia University),
Bob W. Kooi and George A.K. van Voorn (VU, Amsterdam).*