

**Timo Eirola and Jan von Pfaler:** *Nmerical Taylor expansions for invariant manifolds*; Helsinki University of Technology Institute of Mathematics Research Reports A460 (2003).

**Abstract:** *We consider numerical computation of Taylor expansions of invariant manifolds around equilibria of maps and flows. These are obtained by writing the corresponding functional equation in a number of points, setting up a nonlinear system of equations and solving that using a simplified Newton's method. This approach will avoid symbolic or explicit numerical differentiation. The linear algebra issues of solving the resulting Sylvester equations are studied in detail.*

**AMS subject classifications:** 65Q05 65P, 37M, (secondary) 65P30, 65F20, 15A69

**Keywords:** numerical approximation of invariant manifolds, multivariate polynomial, bifurcation, Taylor expansion

ISBN 951-22-6504-4  
ISSN 0784-3143  
HUT Mathematics, 2003

Helsinki University of Technology  
Department of Engineering Physics and Mathematics  
Institute of Mathematics  
P.O. Box 1100, 02015 HUT, Finland  
email:math@hut.fi <http://www.math.hut.fi/>