

**Author:** **Á. JORBA**

Universitat de Barcelona (Spain)

**Title:** *“On the computation of high order power expansions of Poincaré maps”*

**Abstract.** In this talk we will explain a computational technique (called jet transport) to compute high order derivatives of Poincaré maps with respect to initial data and/or parameters. The method is based on the use of automatic differentiation techniques on the propagation of the flow of the ODE. If the flow propagation is done by means of a Taylor method, the resulting procedure is efficient enough to be carried out even with extended precision arithmetic. As applications, we mention the effective computation of normal forms, centre manifolds and stable/unstable manifolds of periodic orbits. In the talk we will discuss the effective computation of 1D and 2D stable/unstable manifolds of periodic orbits on concrete examples.

This presentation summarises collaborations with A. Farrés, G. Gimeno, M. Jorba-Cuscó, N. Miguel and M. Zou.