1053-37-75   **Jean-Pierre FRANCOISE*** (`Jean-Pierre.Francoise@upmc.fr`), 175 Rue de Chevaleret, 75252 Paris, France. *Successive derivatives of return maps and relative cohomology.* Preliminary report.

We consider several extensions of the algorithm of the successive derivatives of return maps to global situations. This algorithm is closely related to relative cohomology and to the complex version of Bautin theory . We also discuss new applications of relative cohomology techniques to global normal forms. This includes both limit cycles of plane vector fields and Hamiltonian systems. We consider for instance the number of limit cycles which can emerge from an elliptic sector. We also discuss the algorithm of successive derivatives of periods and its relation with Birkhoff normal forms.

References: JP Francoise Successive derivatives of a first return map, application to the study of quadratic vector fields. Ergodic Theory and Dynamical Systems. 16 (1996), 87-96.

JP Francoise The successive derivatives of the period function of a plane vector field. Journal of Differential Equations. 146 (1998), 320-335. (Received August 13, 2009)