ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

B. Buffoni – M. Colombo – J. Krieger - H.M Nguyên – Mathematics Section

SEMINAR OF ANALYSIS

***FRIDAY 22 FEBRUARY 2019 - ROOM: MA B1 11 at* 2.15 pm**

Prof. Éric ***SÉRÉ*** *(*université de Paris-Dauphine, France)

will present a seminar entitled:

« *NASH-MOSER WITHOUT NEWTON* »

Abstract:

This is joint work with Ivar Ekeland. The Nash-Moser theorem allows to solve a functional equation F(u)=0 in a "scale" of Banach spaces, assuming that F(0) is very small and that near 0 the differential DF has a right inverse which loses derivatives. The classical proof uses a Newton iteration scheme, which converges when F is of class C^2. In contrast, we only assume that F is continuous and has a Gâteau first differential, which is right-invertible with loss of derivatives. In our iteration scheme, each step consists in solving a Galerkin approximation of the equation, using Ekeland's variational principle. We apply our method to a singular perturbation problem with loss of derivatives studied by Texier-Zumbrun. We will compare the two results and we will show that ours improves significantly on theirs, when applied, in particular, to a nonlinear Schrödinger Cauchy problem with highly oscillatory initial data: we are able to deal with larger oscillations.

Lausanne, January 21, 2019
BB/rb

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Seminars are announced on the Mathematics Section website: http://memento.epfl.ch/maths/