B. Buffoni – B. Dacorogna – J. Krieger – M Nguyên – Section Mathématiques

SEMINAIRE D'ANALYSE

- ***VENDREDI 7 OCTOBRE 2016 à 14h15 - salle MED2 1522***

Docteur **Davit Harutyunyan** (EPFL, Suisse) donnera une conférence sur le thème:

« Towards characterization of all 3 times 3 extremal quasiconvex quadratic forms »

Abstract: A quasiconvex quardatic form defined on the set of all N times n matrices is en extremal if it looses its quasiconvexity whenever a rank-one form is subtracted from it. In the case N=2 or n=2 it is known that any quasi convex quadratic corm is polyconvex, thus the only extremals are the Null-Lagrangians. If n,N>=3, then the study of extremals was widely open and even there was no extremal known (other then the Null-Lagrangians) until 2013. The form f(x\otimes y) can be written as x^TA(y)x for some matrix A(y), whose elements are quadratic forms in y. In the case n=N>=3, we prove that the extremity of f is closely related to the extremality of det(A(y)) as a homogeneous polynomial of 2n-th degree. Whendet(A(y)) is en extremal polynomial, we study the relation f----det(A(y)) nearly completely case by case (there are 3 cases as will be discussed). In the case when det(A(y)) is not en extremal polynomial we conjecture, that f(\xi) is not an extremal either. We also provide an explicit example of an extremal, which is another example of a quasiconvex quadratic form that is not polyconvex. This extremals are believed to derive a new complete theory of bounds on the effective properties of composites (as proposed by Milton, 2013) as have done (sometimes providing not optimal bounds) the Null-Lagangians. We also believe they can help construct new examples of functions that are rank-one convex but not quasiconvex.
This is joint work with Grame Milton (University of Utah).

Lausanne, le 3 octobre 2016
BD/HMN/MM

Les séminaires qui ont lieu à la Section de Mathématiques sont annoncés sur Internet
http://memento.epfl.ch/maths/