Hamilton-Jacobi equations in Weak KAM Theory

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Abstract

In this seminar we will view some results of Weak KAM Theory, due to Mather, Fathi and Aubry.
Starting from weak hypotheses we will reinterpret the KAM theorem in terms of viscosity solutions. We will find a non-perturbative method to build a generating function as a viscosity solution of the so called **general eikonal equation**.
Finally, we will see two applications: an homogenization theorem for solutions of a Hamilton-Jacobi equation and a characterization theorem using Mather measures.

References

[1] L. C. Evans, *Weak KAM theory and partial differential equations*. Notes of the CIME conference on "Calculus of variations and nonlinear partial differential equations, Cetraro, (2005).