

“Carnot-Carathéodory metrics and viscosity solutions”.

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Abstract: In the first part I’ll give some basic notions about Carnot-Carathéodory metrics and viscosity solutions. I’m going to show some examples in order to understand why those theories are introduced.

Moreover I’ll quote some known results of existence and uniqueness for evolutive Hamilton-Jacobi equations, introducing the Hopf-Lax formula (in the classic setting) and showing an important link to the calculus of variation. In the second part I’ll give an existence result theorem in the context of semicontinuous initial data and Hörmander-Hamiltonians. The key to prove this result is to solve the associated eikonal equation.

In the third part I’ll prove a convergence theorem which generalizes a known result for the usual inf-convolutions to the metric setting. In this part I’ll use a Large Deviation Principle in the hypoelliptic case, got by an easy new proof, using some techniques of measure theory .