

SOME RESULTS FOR THE LARGE TIME BEHAVIOR OF HAMILTON-JACOBI EQUATIONS WITH
CAPUTO TIME DERIVATIVE

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We obtain some Hölder regularity estimates for an Hamilton-Jacobi with fractional time derivative of order $\alpha \in (0, 1)$ cast by a Caputo derivative. The Hölder seminorms are independent of time, which allows to investigate the large time behavior of the solutions. We focus on the Namah-Roquejoffre setting whose typical example is the Eikonal equation. Contrary to the classical time derivative case $\alpha = 1$, the convergence of the solution on the so-called projected Aubry set, which is an important step to catch the large time behavior, is not straightforward. Indeed, a function with nonpositive Caputo derivative for all time does not necessarily converge; we provide such a counterexample. However, we establish partial results of convergence under some geometrical assumptions.

This is a joint work with Olivier Ley (INSA-Rennes, France) and Miguel Yangari (EPN, Ecuador).