

Calculus of variations and Weak KAM results in optimal switching problems

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We study the existence of minimizers for a Lagrangian cost functions that arise from optimal switching problems, as well as necessary conditions for minimality, namely, a generalized Euler--Lagrange equation and a conservation of energy principle. Next, we examine how this cost function is related to a weakly coupled system of Hamilton--Jacobi equations, and prove an analogue of Fathi's weak KAM theorem. Finally, we study the long-time behavior of an associated time--dependent system. This is joint work with D. Gomes and A. Figalli.