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Ergodicity of Hamilton-Jacobi equations with a noncoercive nonconvex Hamiltonian in $\mathbb{R}^2/\mathbb{Z}^2$. (English) [Zbl 1201.35089](#)

Ann. Inst. Henri Poincaré, Anal. Non Linéaire 27, No. 3, 837-856 (2010).

The author investigates the long time average behavior of the solutions of the Hamilton-Jacobi equations with a noncoercive, nonconvex Hamiltonian on the torus $\mathbb{R}^2/\mathbb{Z}^2$. Following an approach initiated by *M. Arisawa* and *P.-L. Lions* [*Commun. Partial Differ. Equations* 23, No. 11-12, 2187–2217 (1998; [Zbl 1126.93434](#))], the author gives nonresonance conditions under which the long time average converges to a constant. The main idea in the proof consists of establishing some rigidity properties of the solutions. The author shows that in the resonant case the limit still exists, although it is not constant in general. He also computes the limit at points where it is not locally constant. The paper ends with some statements of open problems.

Reviewer: [Athanasé Papadopoulos \(Strasbourg\)](#)

MSC:

[35F21](#) Hamilton-Jacobi equations

[35F20](#) Nonlinear first-order PDEs

[49J15](#) Existence theories for optimal control problems involving ordinary differential equations

[35R15](#) PDEs on infinite-dimensional (e.g., function) spaces (= PDEs in infinitely many variables)

Cited in **10** Documents

Keywords:

time average; resonance; non-resonance

Full Text: [DOI](#)

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