
Frenkel-Kontorova Models in almost-periodic environments

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Abstract

The Frenkel-Kontorova model describes how an infinite chain of atoms minimizes the total energy of the system when the energy takes into account the interaction of nearest neighbors as well as the interaction with an exterior environment. An almost-periodic environment leads to consider a family of interaction energies which is stationary with respect to a minimal topological dynamical system. In common works with J.-M. Gambaudo, E. Garibaldi, P. Guiraud and P. Thieullen, we give some properties of the minimizing configurations. The main mathematical tools for this study are developed in the frameworks of discrete weak KAM theory, Aubry-Mather theory and spaces of Delone sets.

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