

A scheme for the homogenisation of dislocation dynamics

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Dislocations are line defects moving in crystals. These lines have a motion with normal velocity which is coupled with the equations of elasticity. It is possible to reduce this system to a single non local Hamilton-Jacobi equation describing the motion of dislocations. In this talk I will present some homogenisation results for this model and explain how we recover macroscopic models of elasto-viscoplasticity. I will also present a numerical scheme (and a posteriori estimates) to compute the effective hamiltonian.

The results presented here correspond to joint works with Imbert, Forcadel on the one hand, and with Cacace and Chambolle on the other hand.