1096-74-2493 **Timothy Blass**, **Irene Fonseca**, **Giovanni Leoni** and **Marco Morandotti***
(marco.morandotti@ist.utl.pt), Departamento de Matemática, Av. Rovisco Pais, 1, 1049-001 Lisboa, Portugal. *Dynamics for a System of Screw Dislocations.* Preliminary report.

Dislocations are defects in solid crystalline structures that are characterized by their Burgers vectors, which describe the lattice mismatch. The interest in their study lies in the influence that their presence has on the properties of the material itself.

We describe the energy and the dynamics for a system of screw dislocations subject to anti-plane shear. A variational setup is constructed to find minimizers for the energy functional associated with a system of screw dislocations in an elastic medium. By taking the spatial derivative of the energy in the equilibrium configuration, it is possible to write a system of ordinary differential equations that govern the motion of the dislocations in the material. This model for the dynamics is due to Cermelli and Gurtin.

We rely on standard variational techniques for achieving the results in the first part, whereas a weak notion of solutions (in the sense of Filippov) to ordinary differential equations has to be invoked to solve the dynamics problem. (Received September 17, 2013)