# A fast marching method for the non monotone evolution of fronts and some applications to dislocation dynamics

Maurizio Falcone

SAPIENZA - Universita' di Roma

JNBs 2010

We present a fast-marching algorithm on structured grids for an eikonal equation with a velocity changing sign. The algorithm is an extension of the fast-marching method in two respects. The first is that the new scheme can deal with a time-dependent velocity, and the second is that there is no restriction on its change in sign. We analyze the properties of the algorithm, and we prove its convergence in the class of discontinuous viscosity solutions. We will also discuss the extensions to unstructured grids and to nonlocal velocities for the dynamics of dislocations.