A MUMFORD-SHAH MODEL FOR DISLOCATIONS

RICCARDO SCALA

We propose a 2d model for dislocations in which the vertical displacement is a SBV^2 function and cracks formation are allowed, modelling the mismatch between atom layers. The energy of the system will be a sort of Mumford-Shah functional where the jump set is penalized by a 1/\epsilon factor. So, avoiding the well-known core-radius approach we perform a Gamma limit analysis in various regimes, the first one of which shows how atomic measures modelling dislocations appearance pop up. The result is strongly related with the Ginzburg-Landau model ones, where the compactness of Jacobian determinants (suitably defined) of the displacement is classical.
This is a joint work with Vito Crismale, Lucia De Luca, and Nicolas Van Goethem.