

## Gilles Francfort

### *Interaction between dimensional reduction and higher order perturbations*

This is joint work with I. Fonseca and G. Leoni.

The study focusses on 3d-2d dimensional reduction for a general hyperelastic energy density on a thin flat domain when a vanishingly small higher order term is added to that energy. The smallness of the additional term is controlled by a power of the thickness. The limit behavior is obtained through variational convergence.

In contrast to prior work by Y.C. Shu, we keep track, not only of the limit displacement field, but also of the rescaled gradient, so that the limit behavior is much richer. In particular, we show that, for a critical value of the power of the thickness, the resulting model can be non-local.

In this respect, the impact of the higher-order perturbation in dimensional reduction is much more involved than in the setting of homogenization.