R. Ferreira
F.C.T./C.M.A. da U.N.L., Quinta da Torre, 2829-516 Caparica, Portugal
`ragf@fct.unl.pt`

I. Fonseca
Dept. of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213, U.S.A.
`fonseca@andrew.cmu.edu`

Characterization of the Multiscale Limit Associated with Bounded Sequences in BV

The notion of two-scale convergence for sequences of Radon measures with finite total variation is generalized to the case of multiple periodic length scales of oscillations. The main result concerns the characterization of $(n+1)$-scale limit pairs (u, U) of sequences $\{(u_\varepsilon \mathcal{L}^N {\lfloor \Omega}, Du_\varepsilon {\lfloor \Omega})\}_{\varepsilon > 0} \subset \mathcal{M}(\Omega; \mathbb{R}^d) \times \mathcal{M}(\Omega; \mathbb{R}^{d \times N})$ whenever $\{u_\varepsilon\}_{\varepsilon > 0}$ is a bounded sequence in $BV(\Omega; \mathbb{R}^d)$. This characterization is useful in the study of the asymptotic behavior of periodically oscillating functionals with linear growth, defined in the space BV of functions of bounded variation and described by $n \in \mathbb{N}$ microscales, undertaken in another paper of the authors ["Reiterated homogenization in BV via multiscale convergence", submitted].

Keywords: BV-valued measures, multiscale convergence, periodic homogenization.

MSC: 28B05, 26A45, 35B27