Irene Fonseca, Elvira Zappale:

Multiscale Relaxation of Convex Functionals

The Γ-limit of a family of functionals

$$u \mapsto \int_\Omega f\left(\frac{x}{\epsilon}, \frac{x}{\epsilon^2}, D^s u\right) dx$$

is obtained for $s = 1, 2$ and when the integrand $f = f(x, y, v)$ is a continuous function, periodic in x and y, and convex with respect to v. The 3-scale limits of second order derivatives are characterized.