

# Closure and commutability results for $\Gamma$ -limits

MARTIN JESENKO

Affiliation: Institut für Mathematik, Universität Augsburg, MNF, Augsburg, Germany

email: Martin.Jesenko@math.uni-augsburg.de

Under a suitable notion of equivalence of integral densities we prove a  $\Gamma$ -closure theorem for integral functionals with standard  $p$ -growth: The limit of a sequence of  $\Gamma$ -convergent families is again a  $\Gamma$ -convergent family. Its  $\Gamma$ -limit can be recovered from  $\Gamma$ -limits of the original problems. This result not only provides a common basic principle for a number of linearization and homogenization results in elasticity theory. It also allows for new applications as we exemplify by proving that geometric linearization and homogenization of multi-well energy functionals commute. We then also address the case  $p = 1$  with its difficulties.

Schematically:

$$\begin{array}{ccc} \mathcal{F}_\varepsilon^{(j)} & \approx & \mathcal{F}_\varepsilon^{(\infty)} \\ \downarrow \Gamma & & ? \downarrow \\ \mathcal{F}_0^{(j)} & \xrightarrow{?} & \mathcal{F}_0^{(\infty)} \end{array}$$

The poster is based on joint work with Bernd Schmidt (Augsburg University).

## References:

- [1] M. Jesenko, B. Schmidt: Closure and commutability results for  $\Gamma$ -limits and the geometric linearization and homogenization of multiwell energy functionals. *SIAM J. Math. Anal.* 46 (2014), no. 4, 2525–2553.