1145-49-1272   **Carolin Kreisbeck*** (`c.kreisbeck@uu.nl`), Mathematisch Instituut, Universiteit Utrecht, Postbus 80010, 3508TA Utrecht, Netherlands, and **Elvira Zappale**, D.I.In., Universita degli studi di Salerno, Via Giovanni Paolo II 132, 84084 Fisciano, Italy. *Relaxation of nonlocal supremal functionals.*

Nonlocal functionals in the form of double integrals appear naturally in models of peridynamics. In the homogeneous case, separate convexity of the integrands has recently been identified as a necessary and sufficient condition for weak lower semicontinuity. When it comes to relaxation, though, a characterization of the weak lower semicontinuous envelopes is still largely open. It is in particular unclear whether they can be represented as double integrals.

Motivated by these interesting developments, this talk addresses a related question by discussing homogeneous supremal functionals in the nonlocal setting. We show that weak* lower semicontinuity holds if and only if the level sets of a symmetrized and suitably diagonalized version of the supremand are separately convex. It turns out that, unlike for double integrals, the supremal structure of the functionals we consider here is guaranteed to be preserved in the process of relaxation. The proof of this statement relies on the connection between supremal and indicator functionals, which reduces the problem to studying weak* closures of a class of nonlocal inclusions. We give examples of explicit relaxation formulas for different multi-well functions. (Received September 20, 2018)

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