Agnieszka Kałamajska:

On Lambda-Convexity Conditions in the Theory of Lower Semicontinuous Functionals

Consider the functional $I_f(u) = \int_\Omega f(u(x))\,dx$, where $u = (u_1, \ldots, u_m)$. Assume additionally that each u_j is constant along W_j, some subspace of $\mathbf{R}^n$. We find the family of cones Λ in $\mathbf{R}^m$ such that every Λ-convex function f defines a functional I_f which is lower semicontinuous under the sequential weak $*$ convergence in $L^\infty(\Omega, \mathbf{R}^m)$. Then we apply our result to functionals acting on distributional kernels of differential operators. We also discuss the relations of our problem to the rank-one conjecture of Morrey.

Keywords: lower semicontinuity, quasiconvexity, Young measures

2000 Mathematics Subject Classification: 49J45, 49J10, 35E10.