Journal of Convex Analysis 20 (2013) 355–376

E. Giner
Institut de Mathématiques, Laboratoire MIP, Université Paul Sabatier, 118 route de Narbonne, 31062 Toulouse 04, France
giner@math.univ-toulouse.fr

An Upper Bound for the Convergence of Integral Functionals

Given a σ-finite measure space $(\Omega, \mathcal{T}, \mu)$ endowed with a μ-complete tribe, a separable Banach space E, we consider a topological vector space (X, T), X being a decomposable subspace of measurable E-valued functions defined on Ω. Under a reasonable assumption on the vector topology T, we show that if $(f_n)_n$ is a sequence of extended real-valued measurable integrands defined on the product $\Omega \times E$, with upper epi-limit (or upper Γ-limit) $f = ls_e f_n$, then I_f is in many cases an upper bound for the T-upper epi-limit of the sequence $(I_{f_n})_n$, where I_f, I_{f_n} are the integral functionals defined on X associated to the integrands f, f_n. The cases of Lebesgue spaces endowed with its strong, weak, or Mackey topologies are reached. We discuss also the necessity of the given conditions.

Keywords: Integral functional, upper epi-limits, Γ-convergence, finally equi-integrable sets.

MSC: 26A16, 26A24, 26E15, 28B20, 49J52, 54C35