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A simple integral representation for bounded operators in topological vector spaces

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Abstract
Let E be a locally convex Hausdorff space and let E' be its topological dual, endowed with the weak* topology σ (E', E). Let S be a compact space and let us consider the space C (S,E') of all continuous functions f: S → E', equipped with the uniform topology. In this paper, we prove a simple integral representation theorem, by means of weak integrals against a scalar measure on S, for a class of linear bounded operators T: C (S,E') → E'. When E = ℑ is the Schwartz space on R{double-struck}n (thus ℑ' is the space of tempered distributions), we prove that bounded operators of this class preserve the familiar operations of distribution theory, that is, the operations of derivation and Fourier transform. Also we give an application to weak sequential convergence in this class of operators.

Author Keywords
Bounded operators; Riesz Theorem; Weak integrals

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