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Convolution operators on the dual of hypergroup algebras

Comment.Math.Univ.Carolinae 44,4 (2003) 669-679.

Abstract: Let X be a hypergroup. In this paper, we define a locally convex topology β on $L(X)$ such that $(L(X),\beta)^*$ with the strong topology can be identified with a Banach subspace of $L(X)^*$. We prove that if X has a Haar measure, then the dual to this subspace is $L_C(X)^{**} = cl\{F \in L(X)^{**}; F \text{ has compact carrier}\}$. Moreover, we study the operators on $L(X)^*$ and $L_0^\infty(X)$ which commute with translations and convolutions. We prove, among other things, that if $wap(L(X))$ is left stationary, then there is a weakly compact operator T on $L(X)^*$ which commutes with convolutions if and only if $L(X)^{**}$ has a topologically left invariant functional. For the most part, X is a hypergroup not necessarily with an involution and Haar measure except when explicitly stated.

Keywords: Arens regular, hypergroup algebra, weakly almost periodic, convolution operators
AMS Subject Classification: 43A10, 43A62