

Banach Algebras 2009

*A conference supported by the European Science Foundation under the
ESF-EMS-ERCOT partnership*

*July 14-24, 2009, Stefan Banach International Mathematical Center, Będlewo,
Poland*

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Weighted convolution algebras on subsemigroups of the real line

ABSTRACT. (Based on a joint work with H. G. Dales.) In this talk, we shall quickly introduce the following terms in a Banach algebra: First and second Arens products, left and right topological centers, Arens regular Banach algebra, and Strongly Arens irregular Banach algebra. We shall also discuss some known results on these topics. Then we shall consider weighted convolution algebras $\ell^1(S, \omega)$ on discrete semigroups S with weights ω . In particular, we shall discuss when these algebras are Arens Regular, when they are Strongly Arens Irregular, and when they are neither, giving a variety of examples. We shall introduce the notion of ‘weakly diagonally bounded’ weights, weakening the known concept of ‘diagonally bounded’ weights, and thus obtaining more examples. We shall give a variety of weights with different properties on classical semigroups; namely \mathbb{N} , \mathbb{Z} , \mathbb{Q}^+ , \mathbb{Q} , \mathbb{R}^+ , and \mathbb{R} . We shall also construct a weight ω on $\mathbb{Q}^{+\bullet}$ such that $\liminf_{s \rightarrow 0^+} \omega(s) = 0$.