AUTOMORPHISMS OF WEIGHTED MEASURE ALGEBRAS

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In [5], [6] and [8] we studied the automorphisms of the Volterra algebra on $[0,1]$ and of radical weighted convolution algebras on the half line. The multiplier algebra of each of these algebras can be identified with a measure algebra [4, Thm. 1.4], [11], and played an important role in those studies. In this paper we study the automorphisms of weighted measure algebras. We show that the extensions of the automorphisms of a weighted convolution algebra to its multiplier algebra are the only automorphisms of the multiplier algebra. From this fact we obtain information about the structure of the automorphisms of the measure algebras and for certain classes of weights a complete description of the automorphisms becomes available.

The significance of the measure algebras in the study of homomorphisms and derivations is also apparent in [3], [4], [5], [6], [8], [9] and [10].

Let $\mathbf{R}^+$ denote the non–negative real numbers. By a *radical algebra weight* on $\mathbf{R}^+$, we mean a positive, continuous, submultiplicative function w on $\mathbf{R}^+$, satisfying $w(0) = 1$ and $w(x)^{1/x} \to 0$ as $x \to \infty$. If w is such a weight, and if the Banach space $L^1(\mathbf{R}^+, w)$, consisting of (equivalence classes of) Lebesgue measurable functions f on $\mathbf{R}^+$ satisfying

$$\|f\| = \int_0^\infty |f(x)|w(x)dx < \infty$$

is given the convolution product

$$(f * g)(x) = \int_0^x f(x-y)g(y)dy,$$

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