Semigroups of composition operators on an algebra of Dirichlet series

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Abstract: Since the introduction of the first Banach space of Dirichlet series in 1997, these spaces have attired an increasing attention. Among them, we can find the algebra of Dirichlet series $\mathcal{A}(\mathbb{C}_+)$, consisting on those Dirichlet series convergent in the right half-plane $\mathbb{C}_+$ and which are also uniformly continuous there. This algebra was recently introduced by Aron, Bayart, Gauthier, Maestre, and Nestoridis. In this talk, we will begin providing a description of the symbols Φ giving rise to bounded composition operators in $\mathcal{A}(\mathbb{C}_+)$ and we will denote this class by $\mathcal{G}_{\mathcal{A}}$. We shall also characterise the compact and weakly compact composition operators, which happen to coincide. Then, we shall establish a one-to- one correspondence between continuous semigroups $\{\Phi_t\}$ in the class $\mathcal{G}_{\mathcal{A}}$ and strongly continuous semigroups of composition operators $\{T_t\}$, where $T_t(f) = f \circ \Phi_t$, $f \in \mathcal{A}(\mathbb{C})$. The existence of such semigroups in the class $\mathcal{G}_{\mathcal{A}}$ relies on previous results obtained in the better known setting of Hardy spaces of Dirichlet series $\mathcal{H}^p$, $1 \leq p \leq \infty$, which will be brought into play.

The talk here presented is based on a work in collaboration with professor Manuel D. Contreras (Universidad de Sevilla) and professor Luis Rodríguez Piazza (Universidad de Sevilla).