1142-47-137 **Eva A. Gallardo-Gutierrez***, Departament of Mathematics, Rawles Hall, 831 East Third St., Indiana University, Bloomington, IN 47405-7106. *C_0-semigroups of 2-isometries and Dirichlet spaces.*

A bounded linear operator T on a separable, infinite dimensional complex Hilbert space $\mathcal{H}$ is called a *2-isometry* if it satisfies

$$T^{*2}T^2 - 2T^*T + I = 0,$$

where I is the identity operator. In addition, such operators are called *analytic* if no nonzero vector is in the range of every power of T. It turns out that M_z, i.e. the multiplication operator by z, acting on the classical Dirichlet space, is a cyclic analytic 2-isometry. But, moreover, Richter proved that any cyclic analytic 2-isometry is unitarily equivalent to M_z acting on a generalized Dirichlet space $D(\mu)$.

In the context of Richter's theorem, we will establish a similarity between C_0-semigroups of analytic 2-isometries acting on $\mathcal{H}$ and the multiplication operator semigroup $\{M_{\phi_t}\}_{t\geq 0}$ induced by $\phi_t(s) = \exp(-st)$ for s in the right-half plane $\mathbb{C}_+$ acting boundedly on weighted Dirichlet spaces on $\mathbb{C}_+$. As a consequence, we derive a connection with the right shift semigroup acting on a weighted Lebesgue space on the half line $\mathbb{R}_+$ and address some applications regarding the study of the invariant subspaces of C_0-semigroups of analytic 2-isometries.

Joint work with J. R. Partington (Leeds). (Received August 31, 2018)