Extending semigroups of partial isometries

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A partial isometry V acting on a Hilbert space $\mathcal{H}$ is a continuous linear map which satisfies $(V^*V)^2 = V^*V$.

Let $\mathcal{S}$ be a semigroup of partial isometries acting on a complex, infinite-dimensional, separable Hilbert space. In this paper we seek criteria which will guarantee that the selfadjoint semigroup $\mathcal{T}$ generated by $\mathcal{S}$ consists of partial isometries as well. Amongst other things, we show that this is the case when the set $\mathcal{Q}(\mathcal{S})$ of final projections of elements of $\mathcal{S}$ generates an abelian von Neumann algebra of uniform finite multiplicity.

This is joint work with J. BERNIK (University of Ljubljana), A. POPOV (University of Waterloo) and H. RADJAVI (University of Waterloo).