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Title: Normalizers of tensor products
Abstract: Normalizing unitaries have played an important role in von Neumann algebra theory ever since Dixmier first used them to classify various types of masas in the 1950's. For a containment $B \subseteq M$ of finite von Neumann algebras, a normalizing unitary $u \in M$ is one such that $uBu^* = B$. More generally, a groupoid normalizer is a partial isometry $v \in M$ such that $vBv^* \subseteq B$ and vv^*, $v^*v \in B$. A theorem of Dye asserts a close connection between these concepts for masas: each groupoid normalizer v has the form pu for a unitary normalizer u and a projection $p \in B$. However, this connection disappears in more general settings, and these operators must be studied separately.

In this talk we will describe recent joint work with Junsheng Fang, Stuart White and Alan Wiggins concerning the structure of normalizing unitaries and partial isometries for tensor products of inclusions $B_i \subseteq M_i$, $i = 1, 2$. This is in the context of algebras satisfying $B' \cap M \subseteq B$, which includes the extreme cases of masas and subfactors of trivial relative commutant. For such algebras, a sample result is

$$W^*(\mathcal{GN}(B_1 \overline{\otimes} B_2)) = W^*(\mathcal{GN}(B_1)) \overline{\otimes} W^*(\mathcal{GN}(B_2))$$

where $\mathcal{GN}(\cdot)$ denotes the set of groupoid normalizers. The main tool for obtaining such results is the basic construction algebra $\langle M, e_B \rangle$ arising from an inclusion $B \subseteq M$, and some background on this will be included.