

Free products of finite-dimensional von Neumann algebras and free Araki-Woods factors

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In the early 90s, Dykema showed any free product of finite-dimensional von Neumann algebras equipped with tracial states is isomorphic to an interpolated free group factor (possibly direct sum a finite-dimensional algebra). In joint work with Michael Hartglass, we show that this result holds in the non-tracial case when the interpolated free groups factors are replaced by Shlyakhtenko’s free Araki–Woods factors (equipped with their free quasi-free states). In particular, free products of finite-dimensional von Neumann algebras are now completely classified up to state-preserving isomorphisms. Our methods directly use our other joint work, where we show free Araki–Woods factors arise as the diffuse component of certain von Neumann algebras associated to finite, connected, directed graphs equipped with edge-weightings. In this talk I will discuss these results and show how the graph methodology is used in a simple but essential case.

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