1155-46-449 **Ben Hayes**, **David Jekel**, **Brent Nelson*** (brent@math.msu.edu) and **Thomas Sinclair**. *A random matrix approach to absorption in free products.*

Consider a tracial free product von Neumann algebra $\mathcal{M} = \mathcal{P} * \mathcal{Q}$, where $\mathcal{P}$ and $\mathcal{Q}$ can be embedded into $\mathcal{R}^\omega$. Using random matrix theory, one can show that $\mathcal{P}$ contains any von Neumann subalgebra $\mathcal{N} \subset \mathcal{M}$ which intersects $\mathcal{P}$ diffusely and has 1-bounded entropy zero. Here the 1-bounded entropy of $\mathcal{N}$ is a modification of the free entropy dimension that—roughly speaking—measures how many matrix approximations $\mathcal{N}$ has. This quantity is known to be a von Neumann algebra invariant and in particular is zero for all amenable algebras. Consequently, as a corollary of the aforementioned absorption result, one obtains a novel proof of Popa's famous theorem that the generator MASA in a free group factor is maximal amenable. In this talk I will discuss this result, some aspects of its proof, and a few of its consequences. This is based on joint work with Ben Hayes, David Jekel, and Thomas Sinclair. (Received January 20, 2020)