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von Neumann algebras of strongly connected higher rank graphs

We investigate the factor types of the extremal KMS states for the preferred dynamics on the Toeplitz algebra and the Cuntz-Krieger algebra of a strongly connected finite k -graph. For inverse temperatures above 1, all of the extremal KMS states are of type I_∞ . At inverse temperature 1, there is a dichotomy: if the k -graph is a simple k -dimensional cycle, we obtain a finite type I factor; otherwise we obtain a type III factor, whose Connes invariant we compute in terms of the spectral radii of the coordinate matrices and the degrees of cycles in the graph.