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Reverse plane partitions, skew shapes, and representations of shifted Yangians

The representation theory of shifted Yangians offers a natural playground for studying monoidal cluster categorifications. In particular, the classes of representations called chamber modules can be shown to satisfy the extended QQ-system relations, which describe some mutations in a cluster algebra defined by Geiss–Hernandez–Leclerc. In this talk, we will take a closer look at the chamber modules appearing in these relations and prove that, in the almost dominant case, they admit a remarkable combinatorial description in terms of reverse plane partitions. We will then introduce a broader family of representations related to skew shapes. This is based on joint work in progress with Artem Kalmykov, Joel Kamnitzer, Alexis Leroux-Lapierre, and Alex Weekes.