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Contribution ID: **19**   Type: **not specified**

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Thursday 28 August 2025 17:30 (1 hour)

Three Theorems on the 6j symbol of the modular double of Uq(sl2(R)).

The modular double of Uq(sl2(R)) is an important quantum group in mathematical physics with a continuous spectrum of representations. The 6j symbol from its tensor structure, also known as the Racah-Wigner coefficients, were computed explicitly by Ponsot and Teschner. In this talk, I will present three theorems I proved with various coauthors on this object. The first is that it describes the boundary 3-point structure constant of Liouville theory, joint with M. Ang, G. Remy, T. Zhu. The second is that it describes the fusion transformation of Liouville conformal blocks, joint with P. Ghosal, G. Remy, Y. Sun, and B. Wu. The third is that its semiclassical limit is described by the hyperbolic and AdS volumes of tetrahedra according to its parameter regimes, joint with T. Liu, S. Ming, B. Wu, and T. Yang. Time permits, I will also present the semiclassical limit of the Turaev-Viro invariant for this 6j symbol, which is the hyperbolic volume as expected from the Volume Conjecture.