

High-frequency asymptotics on the sphere and Clebsch-Gordan random walks

Giovanni Peccati (Université Pierre et Marie Curie – Paris 6)

We discuss high-frequency central limit theorems on homogeneous spaces, and show how they can be expressed in terms of convolutions of Clebsch-Gordan coefficients. These coefficients appear in unitary matrices connecting reducible representations of $SO(3)$. This allows to reinterpret part of our results in terms of coupling of angular momenta in a quantum mechanical system. An important motivation for our research comes from the probabilistic representation and the statistical analysis of the Cosmic Microwave Background (CMB) radiation. This is based on joint works with D. Marinucci (Rome).