

A conjecture of Conrey-Farmer-Keating-Rubinstein-Snaith aims to describe the asymptotics of moments of quadratic L-functions. In joint work with Miller, Petersen, and Randal-Williams and in combination with a paper by Bergström-Diaconu-Petersen-Westerland, we proved a version of this conjecture for function fields. Using the Grothendieck-Lefschetz trace formula, Bergström-Diaconu-Petersen-Westerland established a connection between the conjecture and the twisted homology of the braid groups. In our paper, we showed what was needed to make this connection. Homological stability says that the k -dimensional homology groups are all isomorphic for a large enough number of strands of the braid groups. This is even known for twisted coefficients pulled back from polynomial representations of the symplectic groups. We proved that the starting point of stability is independent of which irreducible polynomial representation of the symplectic groups one uses. In the talk, I will explain the connections between number theory, the braid groups, the symplectic groups, and homological stability.