REDUCTION OF 2-DIMENSIONAL TRIANGULLINE REPRESENTATIONS OVER THE HALO REGION, AND EMERTON--GEE STACK

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Associated to each finite-slope eigenform, there is a Galois representation, whose local component at p is known to be triangulline. Conversely, a fixed residual Galois representation, the space of all its possible triangulline lifts typically contains a dense subset coming from the finite-slope eigenforms (of various levels). So understanding the U_p-eigenvalues of modular forms is essentially equivalent to understanding the triangulline representations. Previously, we have worked mostly on the "automorphic side" by studying the p-adic valuations of U_p-operators, known as p-adic slopes of modular forms. In this talk, I will report on a joint work in progress with John Bergdall, Brandon Levin, and Yong-Suk Moon, in which we hope to recover the spectral halo conjecture of Coleman--Mazur using tools from the Galois side by studying the reduction of triangulline (ϕ, Γ)-modules, and at the same time relate this to the reduced fiber of Emerton--Gee stack. The technical novelty is that, we found a way to bypass Kedlaya's slope filtration theory to prove the etaleness of this family of (ϕ, Γ)-modules.