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Harish-Chandra characters and motivic integration

R. Cluckers and F. Loeser defined a class of objects, called constructible motivic exponential functions, which are defined in a field-independent way, by means of logic. Given a non-Archimedean local field K with a choice of a uniformizer and an additive character, they specialize to functions on K (or on varieties defined over K), when the residue characteristic of K is sufficiently large. We expect that Harish-Chandra character of a supercuspidal representation is a specialization of a constructible motivic exponential function on the neighbourhood of the identity that is slightly larger than the neighbourhood on which Harish-Chandra's local character expansion holds, and we can prove it for a certain class of representations. I will discuss this result, and its potential applications to the question about local integrability of characters in positive characteristic.

Joint work with R. Cluckers, C. Cunningham, and L. Spice.