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New developments in the construction of tame, supercuspidal representations

In 2012, Yu gave a talk at American University suggesting the possibility of a new perspective on his construction of tame, supercuspidal representations that would make it more compatible with the local Langlands correspondence. Surprisingly, this compatibility hinges on a small detail, which is the nature of the lifting to a genuine representation of the projective representation of a finite symplectic group called the Weil representation. In joint work with DeBacker, I described an appropriate modification for so called toral supercuspidal representations. Kaletha's work on regular supercuspidal representations suggests a vast generalisation of the work with DeBacker. In this talk, I will report on joint work in progress with Fintzen and Kaletha involving how to perform the necessary modifications to the Weil representation in the setting of regular, and hopefully all tame, supercuspidal representations.