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Research

[Mixed characteristic Geometric Casselman Shalika Formula](#), [arXiv:2408.07953](#). In this joint work, we prove the geometric Casselma–Shalika formula in the setting of Witt vector Grassmanian.

[Integral aspects of Fourier Duality](#) [arXiv:2407.06184](#) In this joint work, we prove several results regarding integral versions of Fourier duality for abelian schemes, using Pappas’ work on integral Grothendieck–Riemann–Roch.

In progress

Relative Langlands on the Fargues Fontaine, the Iwasawa Tate case, joint with Yuta Takaya (Tokyo University). We explicitly compare the period sheaves in the \mathcal{A} -side and \mathcal{B} -side, under the relative Langlands conjectures of Ben-Zvi-Sakellaridis-Venkatesh.

Mixed characteristic Iwahori-Whittaker equivalence, joint with Konrad Zou (Bonn University), this is an application of the previous paper on Casselman-Shalika Formula, where we also prove basic properties of categorical actions in the l -adic setting.

Geometric categorical deformations, examples, joint with Anish Chedalavada (Johns Hopkins University). We are attempting to work on Lurie’s 2010 ICM address on deformations of quantum groups.

Stacky approach to motivic periods, We give a stack interpretation of periods defined by Francis Brown, Pierre Deligne.