BESSEL F-ISOCRYSTALS FOR REDUCTIVE GROUPS

I will first review the Frobenius structure on the classical Bessel differential equation

$$(x\frac{d}{dx})^2u - xu = 0,$$

whose Frobenius traces are classical Kloosterman sums

$$\mathrm{Kl}(a) := \sum_{xy=a\in\mathbb{F}_p} \exp(\frac{2\pi i}{p}(x+y)).$$

Recently, there are two generalizations of this story (corresponding to GL_2-case) for reductive groups: one is due to Frenkel and Gross from the viewpoint of the Bessel connection; another one, due to Heinloth, Ngô and Yun, uses the geometric Langlands correspondence to produce ℓ-adic sheaves. I will report my joint work with Xinwen Zhu, where we study the p-adic aspect of this theory and unify previous two constructions.