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Regularizing the Geometric RTF for the Galois Period on SL_2

The relative trace formula plays a fundamental role in understanding distinguished automorphic representations. In this talk, I introduce a new regularized relative trace formula for the Galois period on SL_2 . I will give an overview of the proof of convergence of the geometric side, and then discuss the fine geometric expansion, with a special focus on the contribution from relative unipotent orbital integrals. It turns out that these can be understood geometrically in terms of the Springer resolution of the nilpotent cone for $\mathrm{Lie}(SL_2)$. This clarifies and generalizes formulas first written down by Labesse and Langlands in the setting of the usual trace formula.