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”fundamental local equivalence” for quantum geometric Langlands

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The key role in the usual geometric Langlands is played by the geometric Satake equivalence, which says that the category of spherical perverse sheaves on the affine Grassmannian Gr_G of the group G is equivalent to the category Rep(G^L) of algebraic representations of the Langlands dual G^L. Despite its importance, the above statement is rather fragile; for example it holds only at the level of abelian categories, but fails at the derived level. A more robust assertion can be formulated by replacing the spherical category by the Whittaker category. In this talk we will introduce the quantum context, which amounts to replacing sheaves on Gr_G by sheaves twisted by a certain gerbe (the latter is the quantum parameter q). It turns out that the Whittaker variant of Geometric Satake admits a deformation, where on the Langlands dual side, the category Rep(G^L) gets deformed to the category of modules over the quantum group, whose quantum parameter is the same q. The construction of the equivalence between the two sides relies on the description of a certain remarkable perverse sheaf on the configuration space of colored divisors, which encodes the combinatorics of the Cartan matrix.

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