Beraldo, Dario


Summary: Let $\mathcal{Y}$ be a derived algebraic stack satisfying some mild conditions. The purpose of this paper is three-fold. First, we introduce and study $\mathbb{H}(\mathcal{Y})$, a monoidal DG category that might be regarded as a categorification of the ring of differential operators on $\mathcal{Y}$. When $\mathcal{Y} = \text{LS}_G$ is the derived stack of $G$-local systems on a smooth projective curve, we expect $\mathbb{H}(\text{LS}_G)$ to act on both sides of the geometric Langlands correspondence, compatibly with the conjectural Langlands functor. Second, we construct a novel theory of $D$-modules on derived algebraic stacks. In contrast to usual $D$-modules, this new theory, to be denoted by $\mathcal{D}^{\text{der}}$, is sensitive to the derived structure. Third, we identify the Drinfeld center of $\mathbb{H}(\mathcal{Y})$ with $\mathcal{D}^{\text{der}}(L\mathcal{Y})$, the DG category of $\mathcal{D}^{\text{der}}$-modules on the loop stack $L\mathcal{Y} := \mathcal{Y} \times_{\mathcal{Y} \times \mathcal{Y}} \mathcal{Y}$.

MSC:
14D24 Geometric Langlands program (algebro-geometric aspects)
14F05 Sheaves, derived categories of sheaves, etc. (MSC2010)
14F10 Differentials and other special sheaves; $D$-modules; Bernstein-Sato ideals and polynomials
18F99 Categories in geometry and topology

Keywords:
derived algebraic geometry; coherent sheaves; formal completions; Hochschild cohomology; DG categories; Drinfeld center; $D$-modules

Full Text: DOI

References:


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