

BPS Counting and Pseudoperiodic Topology

vendredi 16 juillet 2021 13:30 (1 heure)

A holomorphic quadratic differential on a complex curve defines a flat metric with conical singularities. In the case of simple zeroes, T. Bridgeland and I. Smith identified geodesic intervals connecting zeroes, as well as maximal geodesic cylinders, with stable objects in certain 3-dimensional Calabi-Yau category. As a corollary, the counting of such geodesics gives a wall-crossing structure in the Lie algebra of Hamiltonian vector fields on a symplectic algebraic torus.

I will explain that essentially the same numbers give wall-crossing structure in a different graded Lie algebra, of matrix-valued functions on an algebraic torus (joint work with Y. Soibelman). This WCS makes sense for curves endowed with abelian differentials with zeroes of arbitrary order and can be generalized to closed holomorphic 1-forms on complex varieties of arbitrary dimension.

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