

Sheaves for spacetime

mercredi 27 mars 2024 11:00 (1 heure)

We shall study the Cauchy problem on globally hyperbolic manifolds with the only tools of microlocal sheaf theory and the precise Cauchy-Kowalevski theorem.

A causal manifold is a manifold M endowed with a closed convex proper cone $\lambda \subset T^*M$. On such a manifold, one defines the λ -topology and the associated notions of a causal pre-order and a causal path. One introduces the notion of a G -causal manifold, those for which there exists a time function. On a G -manifold, sheaves satisfying a suitable condition on their micro-support and defined on a neighborhood of a Cauchy hypersurface extend to the whole space. When the sheaf is the complex of hyperfunction solutions of a hyperbolic \mathcal{D} -module, this proves that the Cauchy problem is globally well-posed.

We will also describe a “shifted spacetime” associated with the quantization of an Hamiltonian isotopy.

This talk is partly based on papers in collaboration with Benoît Jubin, Stéphane Guillermou and Masaki Kashiwara.

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