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Nonexistence of finite-dimensional quantizations of a noncompact symplectic manifold. (English. English summary)

Differential geometry and applications (Brno, 1998), 593–596, *Masaryk Univ., Brno*, 1999.

A basic algebra of observables \mathfrak{b} on a symplectic manifold M is a Lie subalgebra of $C^\infty(M)$ which is finitely generated, transitive and separating, the Hamiltonian vector fields X_f of elements $f \in \mathfrak{b}$ are complete, and which is minimal with respect to the previous requirements. Note that “ \mathfrak{b} is separating” means that elements of \mathfrak{b} separate globally points of M , and “transitivity” means that the Hamiltonian vector fields $\{X_f: f \in \mathfrak{b}\}$ span the tangent bundle TM .

The main result states that finite-dimensional basic algebras on noncompact symplectic manifolds do not admit faithful representations by skew-Hermitian matrices. This can be understood as a rigorous proof that quantizations of a noncompact symplectic manifold, if they exist, have to be infinite-dimensional.

{For the entire collection see MR 2000e:53004.}

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