Info

This note, that was found here, as a part of a collection
is written (completely with human hands) by Rupadarshi Ray,
was created on November 17, 2023 4:59:20 PM,
was last modified on May 17, 2026 7:36:50 PM, and
was exported on September 7, 2026 3:31:18 PM.

Quantization of Hamiltonian Lie group action on a symplectic manifold

[1]

(M, ω)	$\mathcal{H} \in \mathsf{Hilb}_{\mathbb{C}}$
Hamiltonian action $$G \curvearrowright (M, \omega)$$	A representation $$G \to U(\mathcal{H})$$
Moment map $$\mu : M \to \mathfrak{g}^*$$	$$\mathcal{H} = \bigoplus_n \mathcal{H}_n$$

Current note has 0 direct children and 0 total descendants.

- structures based on sets
  - manifolds
    - $\mathbb{R}$-manifold symplectic
      - Hamiltonian vector fields on a symplectic manifold
        - Quantization of Hamiltonian Lie group action on a symplectic manifold

And it has 5 siblings.

- structures based on sets
  - manifolds
    - $\mathbb{R}$-manifold symplectic
      - Hamiltonian vector fields on a symplectic manifold
        - Integrable Hamiltonian flows
        - Singular integrable flows
        - Hamiltonian Lie group action on a symplectic manifold
        - Quantization of Hamiltonian Lie group action on a symplectic manifold
        - Probability states and flows of an Hamiltonian system

---

1. Understanding hamiltonian G-spaces through quantization | Elliot Kienzle (chessapig.github.io)
Philosophically, quantization converts functions on symplectic manifolds to opreators on hilbert spaces in a structure-preserving way. A symplectic manifold carrying a structure-preserving GG-action quantizes to a GG-action on the hilbert space, or a representation of GG. Using this, we can study representations through the geometry of symplectic manifolds. After outlining this philosophy, I describe a parralelism between symplectic manifolds and representations. Coadjoint orbits are irricudible representations, the moment map is a decomposition into irriducible representations. Constructions which engineer new representations become blueprints for building new symplectic manifolds. These constructions motivate *hyperspherical varieties*, the class of spaces starring in relative langlands duality ↩