Geometry and quantization of symplectic Howe pairs

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Abstract: We study the orbit structure and the geometric quantization of a pair of mutually commuting hamiltonian actions on a symplectic manifold. If the pair of actions fulfils a *symplectic Howe condition*, we show that there is a canonical correspondence between the orbit spaces of the respective moment images. Furthermore, we show that reduced spaces with respect to the action of one group are symplectomorphic to coadjoint orbits of the other group. In the Kähler case we show that the linear representation of the pair of Lie groups on the geometric quantization of the manifold is then equipped with a representation-theoretic Howe duality.