The Symplectic Vortex Equations over the Complex Plane and Quantum Cohomology

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Abstract

The (symplectic) vortex equations are associated to a Hamiltonian action of a connected Lie group G on a symplectic manifold (M, ω), and a principal G-bundle P over a Riemann surface Σ. They are equations for a pair (u, A), where $u : P \to M$ is a G-equivariant map, and A is a connection 1-form on P. These equations were introduced by K. Cieliebak, R. Gaio and D. A. Salamon, and independently by I. Mundet i Riera. In this talk I will explain how counting gauge equivalence classes of solutions of the vortex equations over the complex plane $\Sigma := \mathbf{C}$ gives rise to a ring homomorphism from the equivariant cohomology of M to the quantum cohomology of the symplectic quotient, assuming that M is symplectically aspherical.