

The orbifold K-theory of abelian symplectic quotients. (*Preliminary report.*)

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17/12/08

Abstract:

In their 2004 paper “A new cohomology theory of orbifold”, Chen and Ruan introduced a new kind of invariant, the Chen-Ruan orbifold cohomology ring, which incorporates the data of the orbifold singularities into the product structure. Since 2004, there has been much activity towards giving explicit computations of this ring for specific classes of orbifolds. Using equivariant symplectic techniques, Goldin, Holm, and Knutson showed in 2005 that a new ring, the *inertial cohomology ring* of a Hamiltonian T-space, surjects onto the Chen-Ruan orbifold cohomology of the associated symplectic quotient at a regular value. Using this surjective ring map, they then give explicit algorithms for the computation of the Chen-Ruan ring of orbifold toric varieties and orbifold weight varieties.

In the setting of K-theory, Jarvis, Kaufmann, and Kimura have recently defined the (full) orbifold K-theory ring associated to an orbifold, in analogy with the Chen-Ruan orbifold cohomology ring. In joint work in progress with Goldin, Holm, and Kimura, we define the *inertial K-theory ring* of a Hamiltonian T-space and use *Kirwan surjectivity techniques* to show that the inertial K-theory ring surjects onto the full orbifold K-theory of its symplectic quotient.