GENERALIZED EQUIVARIANT COHOMOLOGIES OF SIMPLICIAL GKM ORBIFOLD COMPLEXES

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GKM orbifolds are a class of orbifolds with a torus action that meets certain conditions, both the set of fixed points of the action and the number of one-dimensional orbits of the action must be finite. In addition, the action must be equivariantly formal. The word GKM originated after the work of Goresky, Kottwitz, and Macpherson (1998), which describes the torus equivariant cohomology ring of any smooth projective toric variety in terms of combinatorial data obtained from its 1-dimensional (complex) orbit structure, now called GKM graph. In this talk, we define ‘ simplicial GKM orbifold complexes ’ and the corresponding combinatorial object ‘simplicial GKM graph complexes,’ extending the concept of a simplicial complex. Then we introduce the concept of filtration of simplicial graph complexes. Using this, we define ‘ build-able GKM orbifold complexes.’ We describe the equivariant cohomology and equivariant K-theory ring of these spaces with rational coefficients. We also introduce divisive simplicial GKM orbifold complexes to compute their equivariant cohomology, equivariant K-theory, and equivariant cobordism ring with integer coefficients. This is based on a joint work with Dr. Soumen Sarkar.