The Chen–Ruan Cohomology of Weighted Projective Spaces

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Abstract. In this paper we study the Chen–Ruan cohomology ring of weighted projective spaces. Given a weighted projective space $\mathbb{P}_{q_0,\ldots,q_n}$, we determine all of its twisted sectors and the corresponding degree shifting numbers. The main result of this paper is that the obstruction bundle over any 3-multi-sector is a direct sum of line bundles which we use to compute the orbifold cup product. Finally we compute the Chen–Ruan cohomology ring of weighted projective space $\mathbb{P}_{1,2,2,3,3,3}$. 

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