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## HASSETT AND LOSEV-MANIN CATEGORIES OF MODULI SPACES AND GRASSMANNIANS $G_{n,2}$

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ABSTRACT. The moduli spaces of weighted *n*-pointed stable curves of genus g together with reduction and forgetful morphisms were introduced by Hassett in [4]. Following his construction we introduce in [3] the category of such genus zero curves, which we call Hassett category. Losev and Manin introduced in [5] the spaces which parametrize the stable curves of genus g endowed with smooth painted by black and white points. Manin proved in [6] that this space can be realized as a Hassett space with suitable weighted points.

It is mathematically justified by Kontsevich and Manin that the formal solutions of the associativity or WDVV equations, whose geometric interpretation is given by Dubrovin by inventing Frobenius manifolds, are the same as cyclic algebras over the homology operad of moduli space  $\bar{\mathcal{M}}_{0,n}$ . Losev and Manin mathematically justified similar connection between the solutions of commutativity equations, that is the pencil of formal connections and homology of the moduli spaces  $\bar{L}_n$ .

The space  $\overline{\mathcal{M}}_{0,n}$  is the well-known GKDM compactification of the moduli space of genus zero *n*-pointed curves. It is proved by Kapranov that  $\overline{\mathcal{M}}_{0,n}$  can be identified with the Chow quotient of the complex Grassmann manifold  $G_{n,2}$  by the action of the algebraic torus. In the paper [2] Buchstaber and Terzić introduced the notion of the universal space of parameters  $\mathcal{F}_n$  for the canonical compact torus action  $T^n$  on  $G_{n,2}$ , which is a compactification of the space of parameters of the main stratum. For the description of the outgrows in this compactification we used the structure ingredients of the orbit space  $G_{n,2}/T^n$  and proved that  $\mathcal{F}_n$  can be identified with  $\overline{\mathcal{M}}_{0,n}$ , providing the description of  $\overline{\mathcal{M}}_{0,n}$  in terms of the equivariant topology of  $G_{n,2}$ .

In this talk we show that the Hassett category as well as the Losev-Manin category can be modeled in terms of the ingredients of the topological model  $(U_n, p_n)$  constructed by Buchstaber and Terzić [1] for the description of the orbit space  $G_{n,2}/T^n$ . It means that  $G_{n,2}/T^n$  is homeomorphic to the quotient space of  $U_n$  by the continuous surjection  $p_n: U_n \to G_{n,2}/T^n$ . Here  $U_n = \Delta_{n,2} \times \mathcal{F}_n$  for the hypersimplex  $\Delta_{n,2}$  and  $p_n$  is constructed in terms of matroidal decomposition of  $\Delta_{n,2}$  and spaces of parameters and virtual spaces of parameters arising from the Plücker coordinates stratification of  $G_{n,2}/T^n$ .

The talk is based on the joint work with Victor M. Buchstaber.

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