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Integrality properties of automorphic forms for triangle groups

This talk is based on the joint work with Shokri arXiv:1307.4372 and Doran, Gannon, Shokri. arXiv:1306.5662. We consider the integrality properties of the coefficients of the mirror map attached to the generalized hypergeometric function with rational parameters and with a maximal unipotent monodromy. We present a conjecture on the p -integrality of the mirror map which can be verified experimentally. We prove it for $n = 2$ and prove its consequence on the N -integrality of the mirror map for the particular cases $1 \leq n \leq 4$. This was a conjecture in mirror symmetry which was first proved in particular cases by Lian-Yau. The general format was formulated by Zudilin and finally established by Krattenthaler-Rivoal. For $n = 2$ we obtain the Takeuchi's classification of arithmetic triangle groups with a cusp, and for $n = 4$ we prove that 14 examples of hypergeometric Calabi-Yau equations are the full classification of hypergeometric mirror maps with integral coefficients. For our purpose we state and prove a refinement of a theorem of Dwork which largely simplifies many existing proofs in the literature.