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GKZ hypergeometric series for the Hesse pencil, chain integrals and orbifold singularities.
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Summary: The GKZ system for the Hesse pencil of elliptic curves has more solutions than the period integrals. In this work we give different realizations and interpretations of the extra solution, in terms of oscillating integral, Eichler integral, chain integral on the elliptic curve, limit of a period of a certain compact Calabi-Yau threefold geometry, etc. We also highlight the role played by the orbifold singularity on the moduli space and its relation to the GKZ system.

MSC:

- 14J33 Mirror symmetry (algebraic-geometric aspects)
- 14Q05 Computational aspects of algebraic curves
- 30F30 Differentials on Riemann surfaces
- 34M35 Singularities, monodromy and local behavior of solutions to ordinary differential equations in the complex domain, normal forms
- 14D07 Variation of Hodge structures (algebraic-geometric aspects)
- 14H52 Elliptic curves

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Keywords:

GKZ system; chain integral; orbifold singularity; Hesse pencil

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