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Moduli of elliptic $K3$ surfaces: monodromy and Shimada root lattice strata (with an appendix by Markus Kirschmer). (English) Zbl 07488361
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Summary: In this paper, we investigate two stratifications of the moduli space of elliptically fibred $K3$ surfaces. The first comes from Shimada’s classification of connected components of the moduli of elliptically fibred $K3$ surfaces and is closely related to the root lattices of the fibration. The second is the monodromy stratification defined by Bogomolov, Petrov and Tschinkel. The main result of the paper is a classification of all positive-dimensionalambi-typical strata, that is, strata which are both Shimada root strata and monodromy strata. We also discuss the relationship with moduli spaces of lattice-polarised $K3$ surfaces. The appendix by M. Kirschmer contains computational results about the 1-dimensional ambiantypical strata.

MSC:
14J10 Families, moduli, classification: algebraic theory
14J27 Elliptic surfaces, elliptic or Calabi-Yau fibrations
14J28 $K3$ surfaces and Enriques surfaces
14J15 Moduli, classification: analytic theory; relations with modular forms

Keywords:
elliptic surfaces; $K3$ surfaces; moduli spaces; monodromy

Full Text: DOI