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On the supersingular reduction of $K3$ surfaces with complex multiplication. (English)
Zbl 07319818

Summary: We study the good reduction modulo $p$ of $K3$ surfaces with complex multiplication. If a $K3$ surface with complex multiplication has good reduction, we calculate the Picard number and the height of the formal Brauer group of the reduction. Moreover, if the reduction is supersingular, we calculate its Artin invariant under some assumptions. Our results generalize some results of Shimada for $K3$ surfaces with Picard number 20. Our methods rely on the main theorem of complex multiplication for $K3$ surfaces by Rizov, an explicit description of the Breuil-Kisin modules associated with Lubin-Tate characters due to Andreatta, Goren, Howard, and Madapusi Pera, and the integral comparison theorem recently established by Bhatt, Morrow, and Scholze.

MSC:
14-XX Algebraic geometry

Full Text: DOI