

# Involutions, Humbert Surfaces, and Divisors on a Moduli Space

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## Abstract

Let  $\mathfrak{M}_2^*$  be the Igusa compactification of the Siegel modular variety of degree 2 and level 2. In earlier work with R. Lee, we carefully investigated this variety. Subvarieties  $D_\ell$  (compactification divisors) and  $H_\Delta$  (Humbert surface of discriminant 1) play a prominent role in its structure; in particular their fundamental classes span  $H_4(\mathfrak{M}_2^*; \mathbf{Z})$ . We return to this variety and consider another class of subvarieties  $K_h$  (Humbert surfaces of degree 4), which we investigate with the help of involutions on  $\mathfrak{M}_2^*$ . We carefully describe these subvarieties and consider the representations of their fundamental classes in terms of the fundamental classes of the subvarieties  $D_\ell$  and  $H_\Delta$ . The space  $\mathfrak{M}_2^*$  is also known in a different context. It can also be described as the space  $\overline{M}_{0,6}$  of stable curves of genus 2 with ordered Weierstrass points. In this context the divisors  $K_h$  are what have come to be known as Keel-Vermeire divisors.