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Quadratic forms and linear systems on abelian surfaces

Although there is an explicit isomorphism that relates the Hilbert scheme of points on an abelian surface to compactified Jacobians of curves in a linear system on the dual abelian surface, computing its action directly is challenging. However, quadratic forms can be used to determine some concrete information about symmetric elements of these moduli spaces. As an application, we prove a novel result: there exist abelian surfaces containing curves with singularities of arbitrarily high multiplicity. This work is joint with Graham McDonald and Peter McDonald.