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*Equidistribution of shapes of cubic fields of fixed quadratic resolvent*

Building upon work of Bhargava, P. Harron, and Shnidman, I will discuss results on the distribution of shapes of cubic fields of fixed quadratic resolvent. The shapes depend on the trace zero form (that is the projection of the trace form to the trace zero space). For instance, I'll show that the shapes of complex cubic fields lie on the geodesic on the modular surface  $SL(2, \mathbf{Z}) \backslash \mathfrak{H}$  determined by their trace zero form and that, in a fixed such geodesic, the shapes are equidistributed with respect to the natural hyperbolic measure. In the case of pure cubic fields (whose quadratic resolvent field is the third cyclotomic field), the corresponding geodesics have infinite length and the equidistribution must be considered in a regularized sense. That these geodesics are of infinite length provides a reason behind the different asymptotic growth rates of pure cubic fields versus other fields of fixed quadratic resolvent seen in the work of Bhargava–Shnidman and Cohen–Morra. I'll also discuss related results such as the fact that the shape is a complete invariant of complex cubic fields.