Shapes of unit lattices of totally real orders form a dense set of lattices

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Given a totally real number field of degree $n > 2$, one can look at the ring of integers and consider the group of units. It is known by a classical theorem of Dirichlet that the group of units is given by a Euclidean lattice in $n - 1$ dimensions (and -1). This also holds true if one considers the group of units in an order inside the ring of integers. One can then try to plot these lattices in the appropriate moduli space of Euclidean lattices and ask where the points lie. It was conjectured by David-Shapira that for $n = 3$ these unit lattices generate a dense set of lattices. We show that the conjecture of David-Shapira is true for all $n > 2$.

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