

The isomorphism problem for Moufang sets of type 1D_4

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Moufang sets are a certain class of doubly transitive permutation groups, which are very easy to define. They were introduced by Jacques Tits as a tool to understand absolutely simple algebraic groups of relative rank one.

We are particularly interested in the special unitary groups $\mathrm{SU}_4(Q, f)$ where Q is a quaternion division algebra and f is a non-degenerate skew-hermitian form with trivial discriminant and of index 1 (relative to the standard involution of Q). These groups are the groups of type 1D_4 . We will explain on an algebraic level why the pair (Q, f) cannot be uniquely recovered from the group $\mathrm{SU}_4(Q, f)$, but only up to triples, and we explain the algebraic connection between these three skew-hermitian forms.