Abstract

Clifford algebra of a quadratic space (V; q) is the quotient of the tensor algebra of V by the two-sided ideal I(V; q), generated by fx x - q(x):1 j x 2 V g. In [Sus77], A.A. Suslin defined a sequence of matrices whose size doubles at each step. Using Suslin construction, for v;w 2 Rn+1 we get a matrix of size 2n x 2n. Moreover, each Suslin matrix S has a conjugate Suslin matrix S such that SS = SS = (v:wT)I2n. In [Chi15], V.R. Chintala showed that Suslin matrices can be used to construct Clifford algebra of H(Rn) with the quadratic form determined by the bilinear form b(v;w) = v:wT . Suslin identities are used to define standard involution on the Clifford algebra. As an application of Suslin matrices, we obtain a proof of the following exceptional isomorphism [Chi15], Spin4(R) ~= SL2(R) x SL2(R) , Spin6(R) ~= SL4(R) Suslin matrices are defined in an inductive way. We tried to generalize the idea of Suslin matrices to a more general set up of central simple algebras. For that, a new set was defined called Suslin set with certain properties that are satisfied by Suslin matrices. We looked at algebras that are isomorphic to M2n(F). Let A be an algebra isomorphic to M2n(F) by the map ϕ. Then, by taking inverse image of Suslin matrices under ϕ, we indeed obtain a Suslin set. We hope that Suslin sets could be useful to understand Suslin matrices.