

1023-16-1708

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We start with a finite dimensional algebra λ over an algebraically closed field k of characteristic 2 such that λ is isomorphic to kS_4 , where S_4 is the symmetric group on 4 letters. The objective of the first part of this work is to find ALL λ -modules $M(S)$ with underlying string S such that the stable endomorphism ring of $M(S)$ over λ is isomorphic to k . The reason is that if this ring is isomorphic to k then $M(S)$ has a well-defined universal deformation ring which is a complete local Noetherian ring with residue field k . First, we consider the simple λ -modules S_0 and S_1 . Then we analyze all non-simple finite λ -modules. Although the study of non-simple λ -modules is infinite at first, we show we can make it finite. We conclude that the stable endomorphism ring is k only for all modules X that are contained in the Auslander-Reiten component of the simple λ -module S_0 . In the near future we hope to find the isomorphism type of the universal deformation ring for the modules X that lie in the component of the AR-quiver of S_0 . (Received September 26, 2006)