The 8th China-Japan-Korea International Conference

Title:
Rudimentary rings: Rings have a faithful indecomposable endoregular module

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Jacobson, in 1945, introduced the notion of primitive rings and proved the structure theorem for primitive rings as an analogue of the Wedderburn-Artin structure theorem for semisimple artinian rings. The existence of a faithful simple module plays a crucial role in studying primitive rings. The study of the class of primitive rings has been a topic of wide interest.

Now, we introduce the notion of a rudimentary ring as a generalization of a primitive ring. A ring R is called *right rudimentary* if there exists a faithful right R-module M such that $\mathrm{End}_R(M)$ is a division ring. We provide results on this new concept and give a number of examples that delimit our results and the notions. Szele showed that there is no noncommutative division ring as the endomorphism ring of an abelian group (as a $\mathbb{Z}$-module). We extend this result on matrix rings over a commutative ring.

(This is a joint work with Cosmin Roman and Xiaoxiang Zhang.)