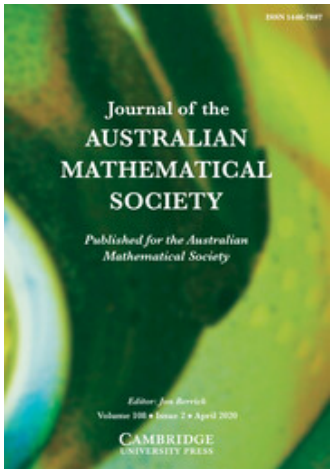

FINITE FIELD EXTENSIONS WITH THE LINE OR TRANSLATE PROPERTY FOR r-PRIMITIVE ELEMENTS

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Summary

Let $r, n > 1$ be integers and q be any prime power q such that $r \mid q^n - 1$. We say that the extension $\mathbb{F}_{q^n}/\mathbb{F}_q$ possesses the line property for r-primitive elements property if, for every $\alpha, \theta \in \mathbb{F}_{q^n}^*$ such that $\mathbb{F}_{q^n} = \mathbb{F}_q(\theta)$, there exists some $x \in \mathbb{F}_q$ such that $\alpha(\theta + x)$ has multiplicative order $(q^n - 1)/r$. We prove that, for sufficiently large prime powers q, $\mathbb{F}_{q^n}/\mathbb{F}_q$ possesses the line property for r-primitive elements. We also discuss the (weaker) translate property for extensions.