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Title: Bounds on the number of ideals in finite commutative nilpotent $\mathbb{F}_p$ -algebras

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Let A be a finite commutative nilpotent $\mathbb{F}_p$ -algebra structure on G , an elementary abelian group of order p^n . If K/k is a Galois extension of fields with Galois group G and $A^p = 0$, then corresponding to A is an H -Hopf Galois structure on K/k of type G . For that Hopf Galois structure we may study the image of the Galois correspondence from k -subHopf algebras of H to subfields of K containing k by utilizing the fact that the intermediate subfields correspond to the $\mathbb{F}_p$ -subspaces of A , while the subHopf algebras of H correspond to the ideals of A . We obtain upper and lower bounds on the proportion of subspaces of A that are ideals of A , and test the bounds on some examples.

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