Half-axes in power associative algebras

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Let A be a commutative, non-associative algebra over a field F of characteristic $\neq 2$. A half-axis in A is an idempotent $e \in A$ such that e satisfies the Peirce multiplication rules in a Jordan algebra, and, in addition, the 1-eigenspace of ad_e (multiplication by e) is one dimensional.

In this talk we show that if A is power associative, then one gets (very) interesting identities between elements in the eigenspaces of ad_e. We use these identities to prove that if A is a primitive axial algebra of Jordan type half (i.e., A is generated by half-axes), and $|F| > 3$, then A is a Jordan algebra.

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