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Nilpotency in automorphic loops of prime power order

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A loop is automorphic if its inner mappings are automorphisms. Using so-called associated operations, we show that every commutative automorphic loop of odd prime power order is centrally nilpotent. Starting with anisotropic planes in the vector space of 2×2 matrices over the field of prime order p , we construct a family of automorphic loops of order p^3 with trivial center.

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