

# Local permutation polynomials and Latin hypercubes

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## Abstract

There is a bijective map between  $n$ -dimensional Latin hypercube of order a prime power  $q$  and local permutation polynomial in  $n$  variables with coefficients the finite field  $F_q$  of degree smaller than  $q$  in each variable. In this talk, I will study how the algebraic variety described by the set of coefficients of these polynomials allows the establishment of new approaches to the problems of counting, enumerating and classifying Latin hypercubes. I will also analyse the set of orthogonal Latin hypercubes and its relation to an orthogonal system of polynomials.