

*Jean-Morlet Chair - Conference*  
Arithmetic Statistics - Statistiques arithmétiques

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Title: *Probabilistic Galois theory for reciprocal polynomials of degree four*

Abstract: A quartic monic reciprocal polynomial has the form  $x^4 + ax^3 + bx^2 + ax + 1$ . Generically, such a polynomial has Galois group  $D_4$  over the rationals, unless it is reducible or has one of the smaller transitive Galois groups  $C_4$  or  $V_4$ . Davis, Duke and Sun in 1998 (as a special case of a result on degree  $2n$  reciprocal polynomials) obtained an upper bound of order of magnitude  $O(H^{3/2} + \varepsilon)$  for the number of non- $D_4$  quartic monic reciprocal polynomials with integer coefficients  $a$  and  $b$  bounded in absolute value by  $H$ . We could improve that bound to the optimal one of  $O(H \log H)$  and for monic quartic reciprocal  $V_4$  polynomials even obtained an asymptotic. Time permitting, we also briefly want to mention some results for sextic reciprocal polynomials.

This is joint work with Benjamin Klahn.