

Zeta functions of cyclic branched covers from hypergeometric functions, and their degeneration

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Abstract

We revisit the arithmetic and geometry of certain one-parameter families of cyclic branched covers over finite fields, inspired by Euler's integral representation of classical hypergeometric functions. Katz showed (and many others have further studied) that factors of their zeta function can be interpreted motivically in terms of finite field hypergeometric sums; and under somewhat strong nondegenerate hypotheses, this method gives a full factorization. We extend this to the general case (allowing arbitrary parameters) by studying degenerations. This is joint work with Tyler Kelly.