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On the Rate of p-adic Convergence of Alternating Sums of Powers of Binomial Coefficients,
Fibonacci Quart. **55** (2017), no. 5, 96–104.

Abstract

Let $m \geq 1$ be an integer and p be an odd prime. We study alternating sums and lacunary sums of mth powers of binomial coefficients from the point of view of arithmetic properties. We develop new congruences and prove the p-adic convergence of some subsequences and that in every step we gain at least three more p-adic digits of the limit. These gains are exact under some explicitly given condition. The main tools are congruential and divisibility properties of the binomial coefficients.