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Divisibility properties of certain binomial sums

We study congruence and divisibility properties of a class of combinatorial sums that involve products of powers of two binomial coefficients, and show that there is a close relationship between these sums and the theorem of Wolstenholme. We also establish congruences involving Bernoulli numbers, and finally we prove that under certain conditions the sums are divisible by all primes in specific intervals.

This is joint work with Marc Chamberland.