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\textit{p-adic equations for power sums}

For odd primes $p$ and positive integers $k$, define $S_k = \sum_{r=1}^{p-1} r^{-k}$. Applying the $p$-adic logarithm to the identity $\prod_{r=1}^{p-1} (1 - \frac{p}{r}) = 1$, we obtain $\sum_{k=1}^{\infty} p^k S_k = 0$, where the convergence is $p$-adic. (This means that the equation holds modulo $p^m$ for arbitrarily large $m$.) In this talk I will give some other $p$-adic equations for the power sums $S_k$. For example, $\sum_{k=1}^{\infty} p^k (-1)^{k-1} B_{k-1} S_k = 0$, where $B_n$ is the $n$th Bernoulli number.