1086-11-582 **Andrew V. Sills*** (asills@georgiasouthern.edu) and **Doron Zeilberger**. *Rademacher's infinite partial fractions conjecture is (almost certainly) false.*

A partition of $n$ is a representation of $n$ as a sum of positive integers where the order of summands is considered irrelevant. Let $p_m(n)$ denote the number of partitions of $n$ with at most $m$ summands. The generating function of $p_m(n)$ is

$$f_m(x) = \sum_{n\geq 0} p_m(n) = \frac{1}{(1-x)(1-x^2)\cdots(1-x^m)}.$$

For any fixed $m$, it is theoretically straightforward to find the partial fraction decomposition of the generating function for $p_m(n)$. Rademacher made a beautiful and natural conjecture concerning the limiting behavior of the coefficients in the partial fraction decomposition of $f_m(x)$ as $m \to \infty$, which was published posthumously in 1973. Little progress had been made on this conjecture until just recently, perhaps in large part due to the difficulty of actually calculating Rademacher's coefficients for even moderately large values of $m$. Zeilberger and I found and implemented a fast algorithm for computing Rademacher's coefficients, and as a result, it now seems quite clear that Rademacher's conjecture is almost certainly *false*! We present some new theorems and conjectures concerning the behavior of Rademacher's coefficients. (Received September 07, 2012)