1047-11-432 **Stephen C. Milne*** (milne@math.ohio-state.edu), Department of Mathematics, The Ohio State University, 231 West 18-th Avenue, Columbus, OH 43210-1174. *Sums of squares, Schur functions, and multiple basic hypergeometric series.* Preliminary report.

We first discuss how we used multiple basic hypergeometric series, Gustafson's C_ℓ nonterminating ${}_6\phi_5$ summation theorem, Andrews' basic hypergeometric series proof of Jacobi's 2, 4, 6, and 8 squares identities, and symmetry and Schur function techniques to prove the existence of explicit exact non-trivial closed formulas for the number of ways of writing a positive integer N as a sum of $4n^2$ or $4n(n+1)$ squares of integers, respectively, without using coefficients of cusp forms. We sketch how we obtained similar results for n^2 or $n(n+1)$ squares, and for $2n(2n-1)$ or $2n(2n+1)$ squares, respectively. The $n=1$ case is classical. We first computed the explicit $n=2$, and/or $n=3$ cases by the aid of Mathematica. With these results as motivation, in our more recent work, we used combinatorial/elliptic function methods to actually derive these explicit exact non-trivial closed formulas for $4n^2$ or $4n(n+1)$ squares of integers, respectively. (Received February 03, 2009)