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Scott T. Parsell* (sparse11@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843-3368. *Iterative Methods for Systems of Additive Forms*. Preliminary report.

We discuss recent progress on obtaining upper bounds for the number of variables required to ensure that a system of diophantine equations of additive type, satisfying appropriate local solubility conditions, has a non-trivial integral solution. Focusing on systems of two forms of differing degree, we develop iterative schemes, based on those used by Vaughan and Wooley in work on Waring's problem, to obtain estimates for mean values of exponential sums over smooth numbers that may be employed within the Hardy-Littlewood method. Time permitting, we may also mention applications of our new mean value estimates to corresponding systems of diophantine inequalities. (Received August 07, 2000)