MISTY OSTERGAARD, Kansas State University

Solutions of Diagonal Congruences with Variables Restricted to Small Intervals

Our interest is in finding solutions to the diagonal congruence

$$\sum_{i=1}^{n} a_i x_i^k \equiv c \pmod{q} \tag{1}$$

in a cube $\mathcal{B}$ of side length b. As an example, for a sufficiently large prime modulus and $n \geq 2k^3$, we obtain a solution to (1) in any cube $\mathcal{B}$ of side length $b \geq p^{\frac{1}{k}+\frac{2(k-2)}{n}+\varepsilon}$. Similar results are found for fewer variables. Refinements are obtained for the case of small solutions, and for the case where the number of variables is very large. Results are also given for a general modulus q.