

On p -adic zeros of systems of diagonal forms restricted by a congruence condition

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RÉSUMÉ. Cet article étudie l'existence de solutions non triviales en entiers p -adiques de systèmes d'équations pour des formes additives. En supposant que l'équation $ax^k + by^k + cz^k \equiv d \pmod{p}$ ait une solution telle que $xyz \not\equiv 0 \pmod{p}$, nous montrons qu'un système quelconque de formes additives de degré k et d'au moins $2 \cdot 3^{R-1} \cdot k + 1$ variables possède toujours des solutions p -adiques non-triviales, si $p \nmid k$. L'hypothèse ci-dessus pour l'existence de solutions non-triviales de l'équation est vérifiée si, par exemple, $p > k^4$.

ABSTRACT. This paper is concerned with non-trivial solvability in p -adic integers of systems of additive forms. Assuming that the congruence equation $ax^k + by^k + cz^k \equiv d \pmod{p}$ has a solution with $xyz \not\equiv 0 \pmod{p}$ we have proved that any system of R additive forms of degree k with at least $2 \cdot 3^{R-1} \cdot k + 1$ variables, has always non-trivial p -adic solutions, provided $p \nmid k$. The assumption of the solubility of the above congruence equation is guaranteed, for example, if $p > k^4$.

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