1056-11-1199 **Dibyajyoti Deb*** (ddeb@ms.uky.edu), Department of Mathematics, University of Kentucky, Lexington, KY 40503. *Poincaré Series of Diagonal Polynomials* . Preliminary report.

Let p be a prime number and $f(x_1, \ldots, x_n)$ be a polynomial with coefficients in $\mathbb{Z}$, the ring of integers. Let c_m denote the number of solutions of $f \equiv 0 \pmod{p^m}$ with $c_0 = 1$. Then the *Poincaré Series* $P_f(y)$ is the generating function

$$P_f(y) = \sum_{i=0}^{\infty} c_i y^i.$$

Denef proved that $P_f(y)$ is always a rational function. We explicitly compute $P_f(y)$ when f is an arbitrary diagonal polynomial, extending results of Qing Han. This is a special case of our main work that deals with diagonal polynomials over certain UFD's. We also present some new results that give a criterion for an element to be an n^{th} power in a complete discrete valuation ring.

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