1015-14-9 **W. A. Zuniga*** (wazuniga@mail.barry.edu), Department of Mathematics, and Computer Science, 11300 NE Second Avenue, Miami Shores, FL 33161. *Zeta functions for polynomial mappings, principalization of ideals, and Newton polyhedra.* Preliminary report.

We will present a geometric description of the poles of the Igusa local zeta function $Z_\Phi(s,f)$ associated to a polynomial mapping $f=(f_1,\ldots,f_l):K^n\rightarrow K^l$, and a locally constant function Φ, in terms of a principalizaton of the $K\left[x\right]-$ideal $I_f=(f_1,\ldots,f_l)$. As a corollary we will present an asymptotic estimation for the number of solutions of an arbitrary system of polynomial congruences in terms of the log canonical threshold of the subscheme given by I_f. We associate to a polynomial mapping $f=(f_1,\ldots,f_l)$ a Newton polyhedron $\Gamma\left(f\right)$ and a new notion of non-degeneracy with respect $\Gamma\left(f\right)$. The novelty of this notion resides in the fact it depends on one Newton polyhedron, and Khovanskii's non-degeneracy notion depends on the Newton polyhedra of $f_1,\ldots,f_l$. By constructing a principalization, we will give an explicit list for the possible poles of $Z_\Phi(s,f)$, $l\geq 1$, in the case in which f is non-degenerate with respect to $\Gamma\left(f\right)$. (Received November 14, 2005)