1067-14-42 **Xiao Xiao*** (xiao@math.binghamton.edu), Department of Mathematical Sciences, Library North 2200, Binghamton University, Binghamton, NY 13902. *Some new results on invariants of F-crystals.*

Let $k$ be an algebraically closed field of characteristic $p > 0$. Let $X$ be a projective smooth variety over $k$. The $n$-th crystalline cohomology of $X$ is a pair $(M, F)$ where $M$ is a finitely generated $W(k)$-module and $F$ is a Frobenius linear endomorphism of $M$. The crystalline cohomology contains more information than the usual Betti cohomology thanks to the extra Frobenius linear endomorphism F. When $M$ is free, the pair $(M, F)$ is called an F-crystal. Vasiu proved (2006) that for each $F$-crystal $(M, F)$ there exists a smallest non-negative integer $n$ such that $(M, F)$ is determined by its F-truncation of level $n$ (roughly speaking by the pair $(M/p^nM, F)$). Therefore to classify these objects, we can follow the following two steps: (i) Fix a Hodge polygon and a Newton polygon, compute the $n$ number of the resulting family of F-crystals over $k$; (ii) classify the F-truncation of $(M, F)$ of level $s$ for all $0 < s < n + 1$. Step (ii) is easier than classifying F-crystals directly especially when $s$ is small. In this talk, I will give an estimate of the n number in the most general case and actually compute it in some special cases, e.g. F-crystals of K3 surfaces type, and when rank of $M$ is 2. Applications to K3 surfaces over $k$ will be mentioned. (Received June 11, 2010)