**Meeting:** 1005, Newark, Delaware, SS 6A, Special Session on High Dimensional Probability

1005-62-18 **Miguel A Arcones*** (arcones@math.binghamton.edu), Department of Mathematical Sciences, Binghamton University, Binghamton, NY 13902. *Large deviations of M–estimators.* Preliminary report.

We will discuss the large deviation principle for M–estimators (and maximum likelihood estimators in particular). Under certain smooth conditions mle's satisfy the large deviation principle with speed $n$ and rate function $I_\theta(t) := -\inf_{\lambda\in\Re^d} \ln E_\theta[\exp(\lambda'\nabla_t \ln f(X,t))]$, where $\{f(x,t) : t \in \Theta\}$ is a family of pdf's, $\Theta \subset \Re^d$ and $\nabla$ denotes the gradient. In the case of full exponential families, this expression agrees with the Kullback–Leibler information between $f(\cdot,t)$ and $f(\cdot,\theta)$. However, for location or scale families this rate function is smaller than Kullback–Leibler information number. We apply our results to obtain confidence regions of minimum size whose coverage probability converges to one exponentially. In the case of full exponential families, the constructed confidence regions agree with the ones obtained by inverting the likelihood ratio test with a simple null hypothesis. (Received December 28, 2004)