A FREE-DIFFERENTIABILITY CONDITION ON THE LOG-MOMENT GENERATING FUNCTION TO GET LARGE DEVIATIONS IN $\mathbb{R}$

HENRI COMMAN

ABSTRACT. Let (μ_α) be a net of Borel probability measures on $\mathbb{R}$, and let (t_α) be a net in $]0, +\infty[$ converging to 0. We assume that the log-moment generating function $L(\lambda)$ exists and is finite for all λ in some nonempty open interval. We gives a sufficient condition to get a vague large deviation principle with rate function the Legendre-Fenchel transform L^*, which involves only the left and right derivatives of L. This strengthens the Gärtner-Ellis theorem by removing the usual essential smoothness hypothesis.

DEPARTAMENTO DE MATEMÁTICAS, UNIVERSIDAD DE SANTIAGO DE CHILE, BERNARDO O'HIGGINS 3363, SANTIAGO, CHILE. E-MAIL: HCOMMAN@USACH.CL