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Steepness in Natural Exponential Families

Afif MASMOUDI

Laboratoire de Probabilité et Statistiques.

Université de Sfax. Faculté des Sciences,

B.P 802, Sfax-TUNISIA

e-mail: Afif.Masmoudi@fss.rnu.tn

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 [Authors](#)



math@tubitak.gov.tr

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Abstract: The present paper studies and develops the notion of steepness in multivariate natural exponential families. Let $F = \{P(m, F); m \in M_F\}$ be a multidimensional natural exponential family parameterized by its domain of the means M_F and let \overline{m} be an element of ∂M_F the means domain boundary. A necessary and sufficient condition for the variance function V_F is established so that the family F be steep at $\overline{m} \in \partial M_F$. Some characteristic properties of a steep family are given. Also, we investigate the asymptotic behaviour of a steep family F at \overline{m} .

Key Words: Convex, natural exponential family, face, means domain, steep, variance function

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