PROBABILITY
AND
MATHEMATICAL STATISTICS
Vol. 35, Fasc. 1 (2015), pp. 73–90

THE FISHER INFORMATION AND EXPONENTIAL FAMILIES PARAMETRIZED BY A SEGMENT OF MEANS

Piotr Graczyk
Salha Mamane

Abstract: We consider natural and general exponential families $(Q_m)_{m\in M}$ on $\mathbb{R}^d$ parametrized by the means. We study the submodels $(Q_{\theta m_1+(1-\theta)m_2})_{\theta\in[0,1]}$ parametrized by a segment in the means domain from the point of view of the Fisher information. Such a parametrization allows for a parsimonious model and is particularly useful in practical situations when hesitating between two parameters m_1 and m_2. The most interesting cases are multivariate Gaussian and Wishart models with matrix parameters.

2000 AMS Mathematics Subject Classification: Primary: 62H12; Secondary: 62H10.

Keywords and phrases: Fisher information, efficient estimator, exponential family, multivariate Gaussian distribution, Wishart distribution, parsimony.