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# Some results on a $\chi$-divergence, an~extended~Fisher information and~generalized~Cramér-Rao inequalities

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We propose a modified $\chi^{\beta}$-divergence, give some of its properties, and show that this leads to the definition of a generalized Fisher information. We give generalized Cram\'er-Rao inequalities, involving this Fisher information, an extension of the Fisher information matrix, and arbitrary norms and power of the estimation error. In the case of a location parameter, we obtain new characterizations of the generalized $q$-Gaussians, for instance as the distribution with a given moment that minimizes the generalized Fisher information. Finally we indicate how the generalized Fisher information can lead to new uncertainty relations.

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