

# THE INFORMATION MATRIX, SKEWNESS TENSOR AND $\alpha$ -CONNECTIONS FOR THE GENERAL MULTIVARIATE ELLIPTIC DISTRIBUTION

ANN F. S. MITCHELL

*Department of Mathematics, Imperial College of Science, Technology and Medicine,  
Huxley Building, 180 Queen's Gate, London SW7 2BZ, U.K.*

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**Abstract.** Expressions for the entries of the information matrix and skewness tensor of a general multivariate elliptic distribution are obtained. From these the coefficients of the  $\alpha$ -connections are derived. A general expression for the asymptotic efficiency of the sample mean, when appropriate as an estimator of the location parameter, is obtained. The results are illustrated by examples from the multivariate normal, Cauchy and Student's  $t$ -distributions.

*Key words and phrases:* Multivariate elliptic distributions, information matrix, skewness tensor,  $\alpha$ -connections, sample mean, asymptotic efficiency, normal, Cauchy and Student's  $t$ -distributions.