Geophysical Research Abstracts, Vol. 8, 00443, 2006
SRef-ID: 1607-7962/gra/EGU06-A-00443

Relations of three dispersion measures used in Flood Frequency Analysis

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Three dispersion measures, i.e., the standard deviation, the mean deviation about the mean and the second $L-$moment, are analyzed in terms of their properties and mutual relationships. Emphasis is put on the mean deviation, as it is less recognized than two other dispersion measures.The relations of the dispersion measures have been derived for distributions applied in flood frequency analysis (FFA). For unbounded distributions there is a distribution dependent constant value of the ratio of dispersion measures, or equivalently of respective coefficients of variation. For lower-bounded two-parameter distributions, the relation of the coefficients of variation is not linear but it is also distribution dependent. For lower-bounded three-parameter distributions, the dispersion measure ratios, or equivalently the variation coefficient ratios, depend on the skewness coefficient and show a strong distributional dependence. It is shown that the mean deviation statistics may be highly competitive to the two other dispersion measure statistics if applied in FFA for parameters estimation.