Geophysical Research Abstracts
Vol. 20, EGU2018-19687, 2018
EGU General Assembly 2018

The Use of Signed Low-Order Fractional Moments in the Parameterization of Asymmetric Lévy Noises

Javier Allan Guzman Sanluis and Alin Andrei Carsteanu

Instituto Politécnico Nacional (IPN), Escuela Superior de Física y Matemáticas (ESFM), Ciudad de México, Mexico (alin@esfm.ipn.mx)

Fractional Lévy noises arise naturally in a variety of geophysical processes. Unlike the case of Gaussian marginal probability distributions, other Lévy-stable distributions are heavy-tailed (their moments are finite only up to an order equal to their stability parameter α), and may be asymmetric. In this latter case, absolute fractional moments $\mathrm{E}\{|X|^p\}$, $p < \alpha$, typically used to estimate the scale parameter, do not help for the estimation of the asymmetry parameter β. For the aforementioned purpose, we present herein the use of signed fractional moments $\mathrm{E}\{|X|^p \mathrm{sign}(X)\}$, $p < \alpha$, together with an application to hydrometeorological data.