Geophysical Research Abstracts
Vol. 14, EGU2012-14219, 2012
EGU General Assembly 2012

Seasonal autoregressive modeling of a skew storm surge series

J. Weiss (1,2), P. Bernardara (1,2), M. Andreewsky (1), M. Benoit (1,2)

(1) Laboratoire National d'Hydraulique et Environnement (LNHE), EDF R&D, 6 quai Watier, BP 49, 78401 Chatou cedex, France , (2) Saint-Venant Laboratory for Hydraulics, Université Paris Est (joint research unit between EDF R&D, CETMEF, and Ecole des Ponts ParisTech), 6 quai Watier, BP 49, 78401 Chatou cedex, France

Autoregressive (AR) models are shown to be a simple and practical option for the description of skew surge (i.e. a surge occurring at the time of a high tide) series. In particular, seasonal AR models of skew surge series are calibrated on 35 sites located along the coasts of the European Atlantic Ocean, the English Channel and the Southern part of the North Sea. Moreover, in order to take into account the non-Gaussian nature of the series, the innovation process is modeled through a Normal Inverse Gaussian distribution.
These models can provide relevant information about: i. the correlation length of the surge phenomena, ii. forecasts of short-term surge occurrences based on a limited set of past observations and iii. inference from plausible longer series, which may have larger extremes than what is observed, permitting a statistical description of simulated extremes. These three characteristics are discussed for a selected site, the Saint-Nazaire harbor (France), with respect to the storm surge that occurred during the Xynthia storm of February 2010.