Geophysical Research Abstracts,
Vol. 10, EGU2008-A-11285, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-11285
EGU General Assembly 2008

Predicting Errors of Weather Forecasts

S. Hallerberg (1), J. Bröcker (1), L. A. Smith (2)

(1) Max Planck Institute for the Physics of Complex Systems, Dresden,
(2) Centre for the Analysis of Time Series, London School of Economics
(sarah@mpipks-dresden.mpg.de)

There is evidence that in certain circumstances, events are the better predictable, the larger they are. This was for example reported for predictions of avalanches in systems which display self organized criticality [1], and also in multi-agent games[2]. Furthermore, this effect was studied in detail for predictions employing precursory structures in stochastic processes [3],[4] and the quality of the predictions was quantified using the receiver operating characteristic (ROC), and the precursors were determined as the maxima of conditional probability distributions. In these studies on stochastic processes, the precursors were determined as the maxima of conditional probability distributions. Thus, the predictions were based on purely statistical considerations. In this contribution we are interested in the question, whether one can also observe larger events to be better predictable, in situations where the forecasts are constructed from information provided by a dynamical model. In particular, we investigate large errors in ECMWF's high resolution medium range temperature forecasts. The forecasts are constructed by using information from the corresponding forecasts of the ensemble. To evaluate the performance, we use not only the ROC-curve, but also the ignorance. Again, it is observed that large events (i. e. , large errors) are the better predictable, the larger they are.

[1] A. B. Shapoval, M. G. Shrirman, *How size of target avalanches influence prediction efficiency*, International Journal of Modern Physics C, **17**:[1777-1790] (2006).

[2] D. Lamper, S. D. Howison, N. F. Johnson , *Predictability of Large Future Changes in a Competitive Evolving Population*, Phys. Rev. Lett. **88**(1)(2002).

[3] S. Hallerberg, E. G. Altmann, D. Holstein, H. Kantz, *Precursors of Extreme Increments*, Phys. Rev. E **75**,1 (2007)

[4] S. Hallerberg and H. Kantz, *Influence of the Event Magnitude on the Predictability of Extreme Events*, Phys. Rev. E 77, 011108 (2008)