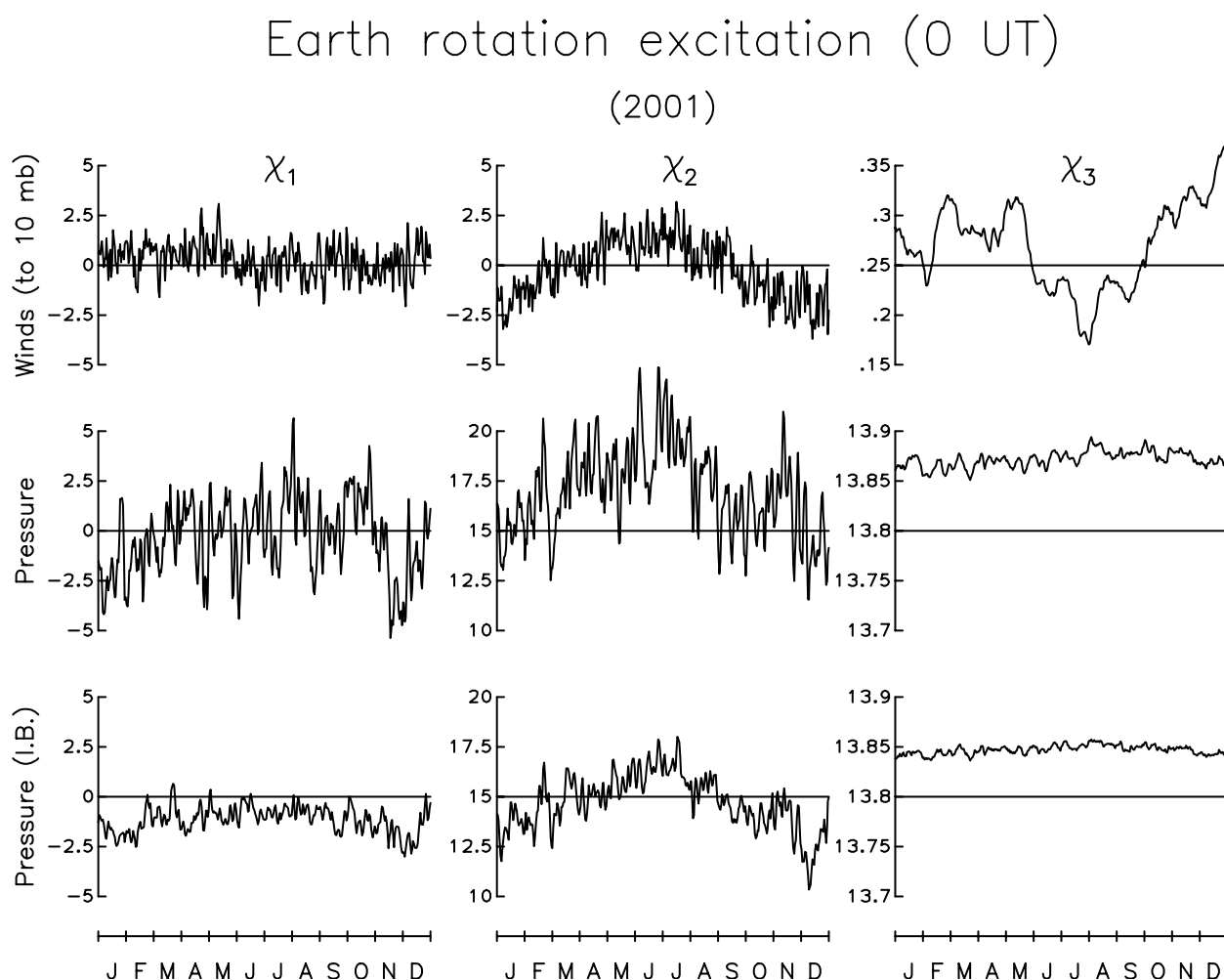


3.5.6.1 Special Bureau for the Atmosphere

In conjunction with the U.S. National Oceanic and Atmospheric Administration (NOAA), the SB Atmosphere has produced and made available atmospheric parameters from 4 different operational meteorological centres related to the needs of the IERS. We have also produced data from atmospheric reanalyses, spanning back to 1948. SBAthmosphere organized a system to operate in two modes. In the first, it supplies the data in near real time through the service at NOAA, including both analyses and forecasts. In the second mode, it updates monthly archives of the data on the FTP server at Atmospheric and Environmental Research, Inc. (AER).

Figure 1: Atmospheric excitation of polar motion (equatorial components X_1 and X_2) and Earth rotation (axial component X_3), given in nondimensional units, based on the reanalyses of the U.S. National Centers for Environmental Prediction-National Center for Atmospheric Research for the year 2001, at 00 UTC. Separate values are given for the effect of wind, pressure, and pressure as modified by the inverted barometer.



The principal data prepared relate to atmospheric excitations of the Earth rotation vector, as forced by changes in the winds and surface pressure of the atmosphere, known respectively also as the motion and mass terms of the atmospheric angular momentum (AAM). For the axial component, related to length of day, the stronger term is the motion one, and for the equatorial term, related to polar motion, the mass term dominates. An “inverted barometer” correction is produced to the mass terms, designed to model an equilibrium condition of the oceans in which the oceans are depressed in response to a higher atmospheric pressure and rise in response to a lower one. The atmospheric excitations for Earth rotation/polar motion for the year 2001, based on the NCEP-NCAR reanalysis are given in Fig. 1. Though available 4 times daily, these are given here once daily, at 0 UT, for clarity and to eliminate high amplitude subdaily signals.

SBAtmosphere also computes the AAM terms, locally, in a number of equal-area sectors distributed around the globe, as well as globally. In addition, SBAtmosphere computes the mean atmospheric surface pressure over the globe, and various spherical harmonics, which are related to the Stokes coefficients of the Earth gravity field. Users log in to our ftp sites to obtain the desired information. Having kept track of our data usage during a recent short period, for example, the data were accessed by 12 different IP (Internet Protocol) addresses during two recent months of 2001.

Two reports have been prepared:

Salstein, D. A., O. de Viron, M. Yseboodt, and V. Dehant, 2001: High-frequency geophysical fluid modeling necessary to understand Earth rotation variability, EOS. AGU Publication, 82(21) pp. 237-238.

Salstein, D.A., and A. J. Miller, 2001: The special bureau for the atmosphere of the International Earth Rotation Service, submitted, IERS Technical Note, ed. B.F. Chao, International Earth Rotation Service.

David A. Salstein