ATMOSPHERIC EXCITATION OF POLAR MOTION: COMPARISON OF THE POLAR MOTION SPECTRUM WITH SPECTRA OF EFFECTIVE ATMOSPHERIC ANGULAR MOMENTUM FUNCTIONS

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The spectra of different combinations of the effective atmospheric angular momentum functions, determined by the National Meteorological Center of the USA, were compared with the spectrum of polar motion, determined from a combination of all available data by the Bureau International de l'Heure in Paris. The spectra were obtained by the method of fast Fourier transform. To compare the amplitudes and phases, the transfer function, derived for an Earth model with a fluid core, visco-elastic mantle and lineary reacting ocean, was used. It was found, for the dominating annual term, that the influence of the wind component is substantially smaller than would follow from the data sampled at midnight UT, but still significant. The combination of the resting wind term with the pressure term corrected for inverted barometer is, however, not sufficient to explain fully the observed polar motion with annual period. It is shown that the difference in phase can very probably be completely ascribed to the influence of ground water storage changes at this frequency.

Key words: Earth rotation – polar motion – atmospheric excitation