

Long-term decadal scale variations of sea level climatic parameters in brazilian littoral region

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A bidecadal periodicity in annual rainfall level with great amplitude of variation up to 90% was recently discovered for several littoral regions of Brazil. The correlation with the 22-year solar magnetic field cycle reaches ~80% during 100 - 150 years of observations. The rainfall level climatic parameter is, certainly, connected with a temperature and a pressure in troposphere. Surprisingly, the annual sea level temperature series of hundred year duration in the same regions do not correlate neither with the 11 year nor the 22-year solar cycles. However, it was found by Labitzke (1988) that in stratosphere in the southern hemisphere during a summer there exist zones with high, greater than 70%, correlation coefficients between the 11-year solar cycle (exactly with the 10.7 cm solar flux) and 30 - 200 hPa pressure heights, and between the cycle and the stratospheric temperatures. This high correlation is dependent on the phase of the quasi-biennial oscillations (QBO) of the equatorial stratospheric wind and appears only during the east phase of the QBO. We have carried out Fourier analysis of the long hundred years data set of Pelotas sea level temperatures from 1900 up to 2000 which result does not show 11-year periodicity, however it exhibits small amplitude of bidecadal cycle. Performing an analysis similar to that of Labitzke (1988) for sea level summer temperature set of Pelotas for 1954 - 1998 distributing it by the QBO phase, we found that the summer temperatures in Pelotas do not correlate with 11 solar cycle neither at east nor at west QBO phase. But they correlate better with 22 year solar cycle with the correlation coefficient of about 50% at the west QBO phase and of about 66% at the east QBO phase with temperature values shifting over two years. The sea level climatic parameters, such as rainfalls, temperatures and pressure, and ambient climatic parameters such as tree ring growth, etc., show the distinguish 22-year variation wave in Brazilian region. To study these variations could help to explain the long-term regularities governing by the climate in this region and, possibly, utilize them for long-term forecasting. Labitzke, K. and H. van Loon, Associations between the 11-year solar cycle, the QBO and the atmosphere, *J. Atm. & .-Terr. Phys.*, 50, 197, 1988.


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