



Observational evidence of ENSO signature in polar regions

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We provide evidence of ENSO influence on the winter climate variability in NH during the last 150 years via signals in the 2.2, 3.5, 5.7 and 13.9 year bands. The contribution from the signals to the total variance is relatively weak, varies considerably with time, but is statistically significant. Phase relationships for the different frequency signals suggest that there are different mechanisms for distribution of the 2.2-5.7 year and the 13.9 year signals. The 2.2- 5.7 year signals, generated about three months earlier in the tropical Pacific Ocean, are transmitted via the stratosphere, and the Arctic Oscillation (AO) mediating propagation of the signals. In contrast the 13.9 year signal propagates from the western Pacific as eastward propagating equatorial coupled ocean waves, and then fast boundary waves along the western margins of the Americas to reach both polar regions, and has a phase difference of about 1.8-2.1 years by the time it reaches the Arctic.