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PERIODIC VARIATION CHARACTERISTICS OF THE HIGH-LATITUDINAL TROPOPAUSE OVER POINT BARROW (71.3°N, 156.8°W)

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The periodic variation characteristics of high-latitude tropopause over Point Barrow (71.3°N, 156.8°W) are studied with radiosonde observation temperature data during 1999-2011. Both tropopause temperature and height vary annually and the tropopause temperature is high in summer and low in winter while the tropopause height correlates with the tropopause temperature. Affected by the sudden stratospheric warming and the stratosphere unusually cold events, the tropopause temperature and height show semi-annual variation. Their time-frequency spectra with planetary-wave-scale-period between 2 and 30 days are also analyzed. During the thirteen years, the conspicuous planetary-wave-scale-period fluctuations of the tropopause temperature and height could be found constantly. However the tropopause temperature and height fluctuations are not always synchronous, and sometimes only one of them appears remarkable periodic fluctuation. Furthermore, the tropopause height mainly anticorrelates with tropopause temperature and their negative correlation coefficient increases with period. At last, the relationships between the planetary waves and the tropopause are discussed.