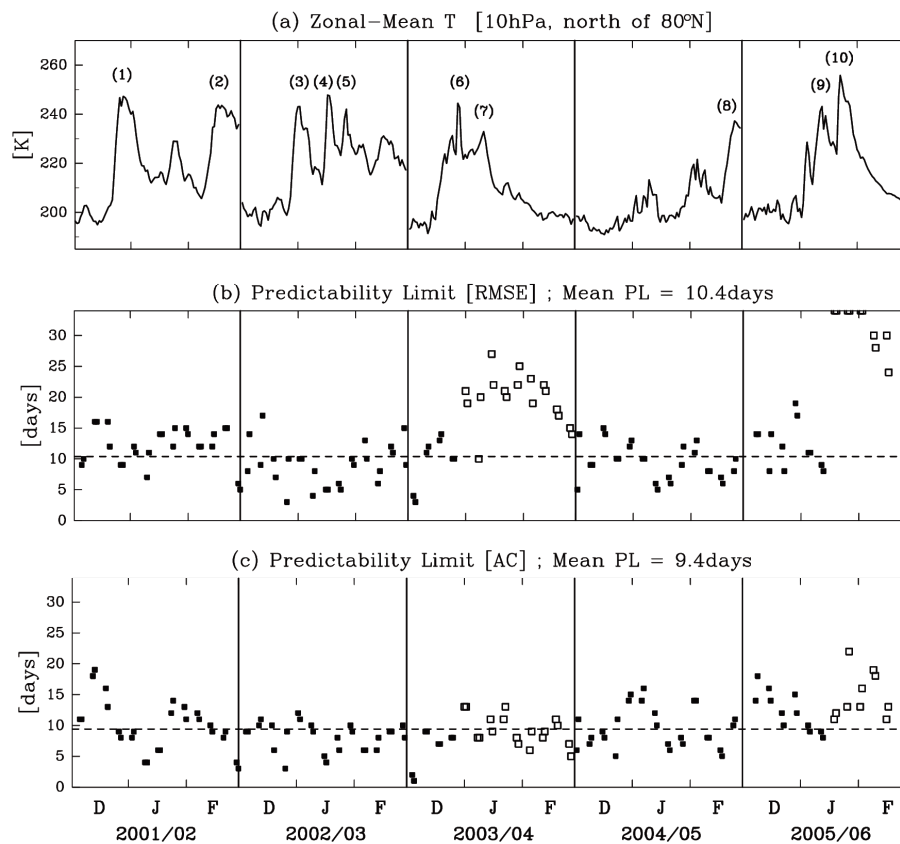Figure 1. (a) Time variation of observed zonal-mean temperature T [K] averaged over latitudes north of 80°N at 10 hPa. Stratospheric sudden warming events are numbered. (b) and (c) show the predictability based on the Root-Mean-Square Error (RMSE) and Anomaly Correlation (AC) of 10-hPa extratropical geopotential height field for the JMA ensemble 1-month forecasts performed during five winters from 2001/02 to 2005/06, respectively. Black (white) squares show the predictability limit during the disturbed (undisturbed) phase when the amplitude of planetary waves is relatively large (small). The broken horizontal line indicates the averaged predictability over the disturbed phase. The abscissa in (b) and (c) denotes the initial time of each forecast.

- Practical predictability of the stratospheric circulation in the boreal winters during 2001-2006 is examined using the archive of the JMA 1-month ensemble forecasts based on the Root-Mean-Square Error (RMSE) and Anomaly Correlation (AC) for the 10-hPa geopotential height.

- The predictable period of the stratospheric circulation is estimated at about 10 days, and it exhibits large variability in comparison with that of the troposphere, which is associated with the large variation of the stratospheric planetary wave activity. The predictable period estimated by the RMSE during the undisturbed phase when the planetary wave has small amplitude is much larger than that during the disturbed phase. However, the predictable period estimated by the AC is comparable for both phases. Thus, the horizontal pattern of the stratospheric circulation is less predictable even though the forecast error is quite small (Figure 1).