New results from the in situ measurements of thermospheric compositions

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Three “SZ” atmospheric composition detectors were on board. spacecrafts “SZ-2”, “SZ-3” and “SZ-4” launched on 10th January 2001, 26th March 2002 and 31th December 2002 separately.

A large quantity of thermospheric composition data at the orbital altitude ranging from 330 to 410 Km were collected, from which some quite new results were deduced. This time period was just in the second peak of the 23rd solar cycle which included two peaks, and met a rather lower solar activity situation ($F_{10.7}$ <100). In addition, several strong geomagnetic disturbance events were happened in the duration.

Measurement results show that the most abundant neutral component in the thermosphere at “SZ” spacecraft orbit altitudes is atomic oxygen with abundances varied around 60%$\sim$90% corresponding to the variation of altitude, local time, solar activity and geomagnetic activity. Measurements also indicate an abnormal N_2 density increase and O density decrease in the higher latitude areas during geomagnetic disturbance peaks, and these changes appeared unsymmetric for the south and north hemisphere of the earth.