

AN ESTIMATION OF TROPOSPHERE CORRECTIONS OF GPS MEASUREMENTS ON POINTS ON THE BAIKAL GEODYNAMIC GROUND

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The purpose of researches are

*to determine the zenith troposphere delay (ZTD) at GPS sites;
to determine a connection of the ZTD with meteorological
data.*

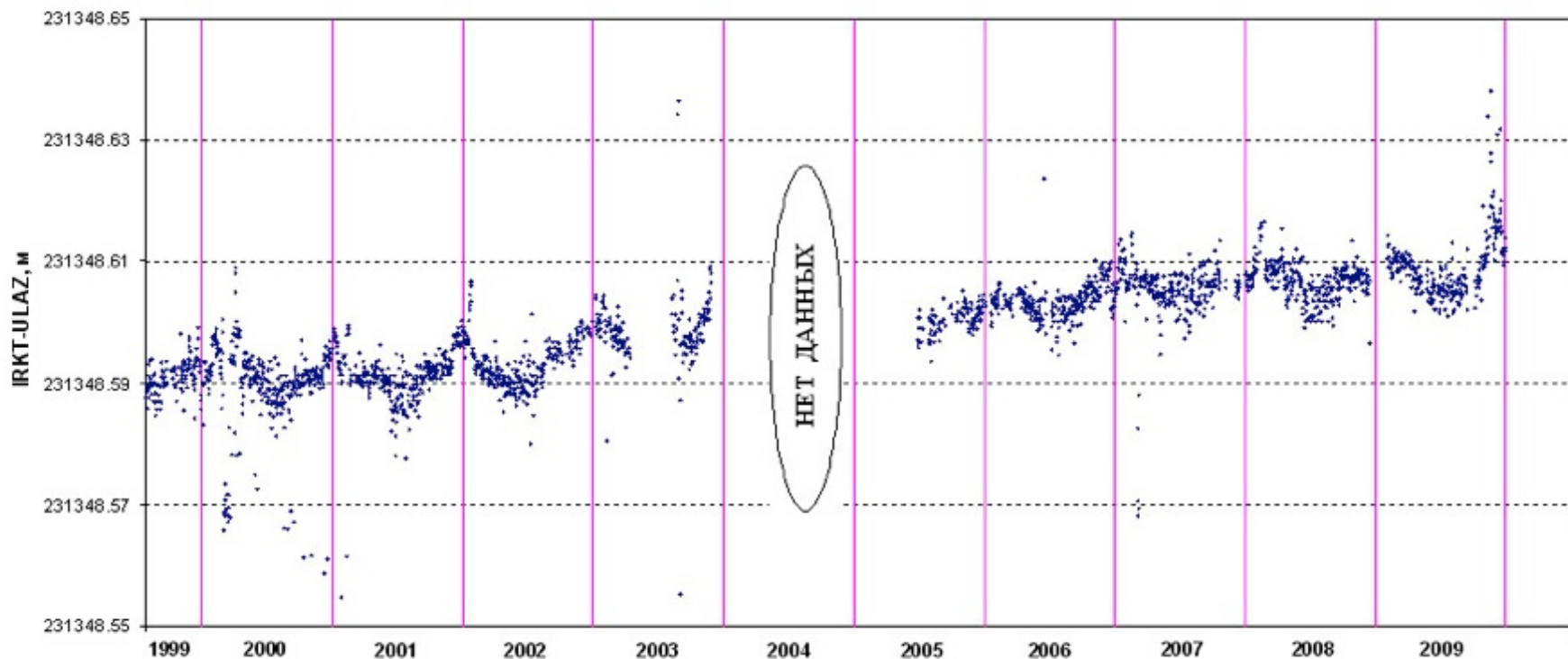
Abstract.

The troposphere zenith total delay (ZTD) determined from GPS measurements is an important parameter of the atmosphere. This delay is determined by a coefficient of the troposphere refraction. In the report we consider data of the permanent ULAZ and IRKT GPS stations from 1999 up to nowadays. Utilizing the method of exact estimation of ZTD, the use of it for atmospheric and climatologic applications is possible. The ZTD and surface pressure series at ULAZ and IRKT points in winter period reveal a consistent variation pattern between ZTD and surface pressure, and indicate a connection between GPS ZTD and atmospheric processes.

The network of permanent and temporal GPS sites within the Baikal geodynamic ground



The dynamics of the displacement of the site of ULAZ relatively to the site of IRKT during 1999-2009.



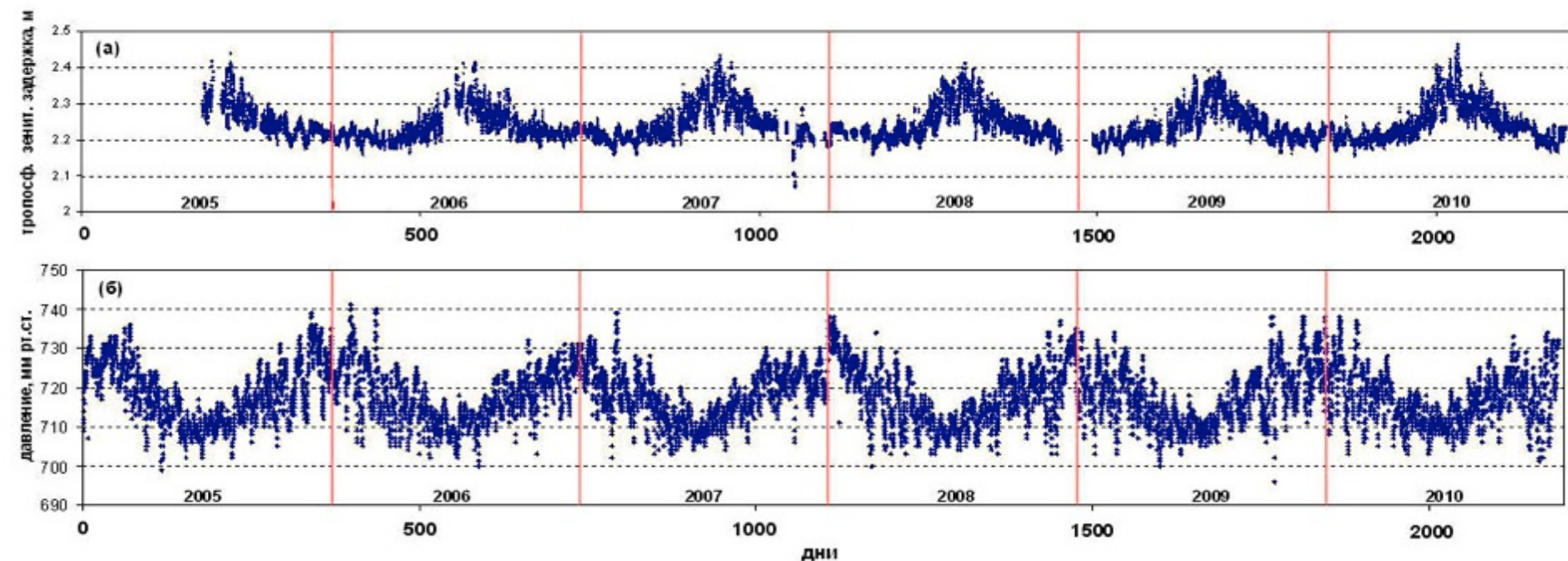


Fig. 3. Temporal rows of the troposphere zenith delay and the ground atmosphere pressure at the site of ULAZ during 2005-2010.

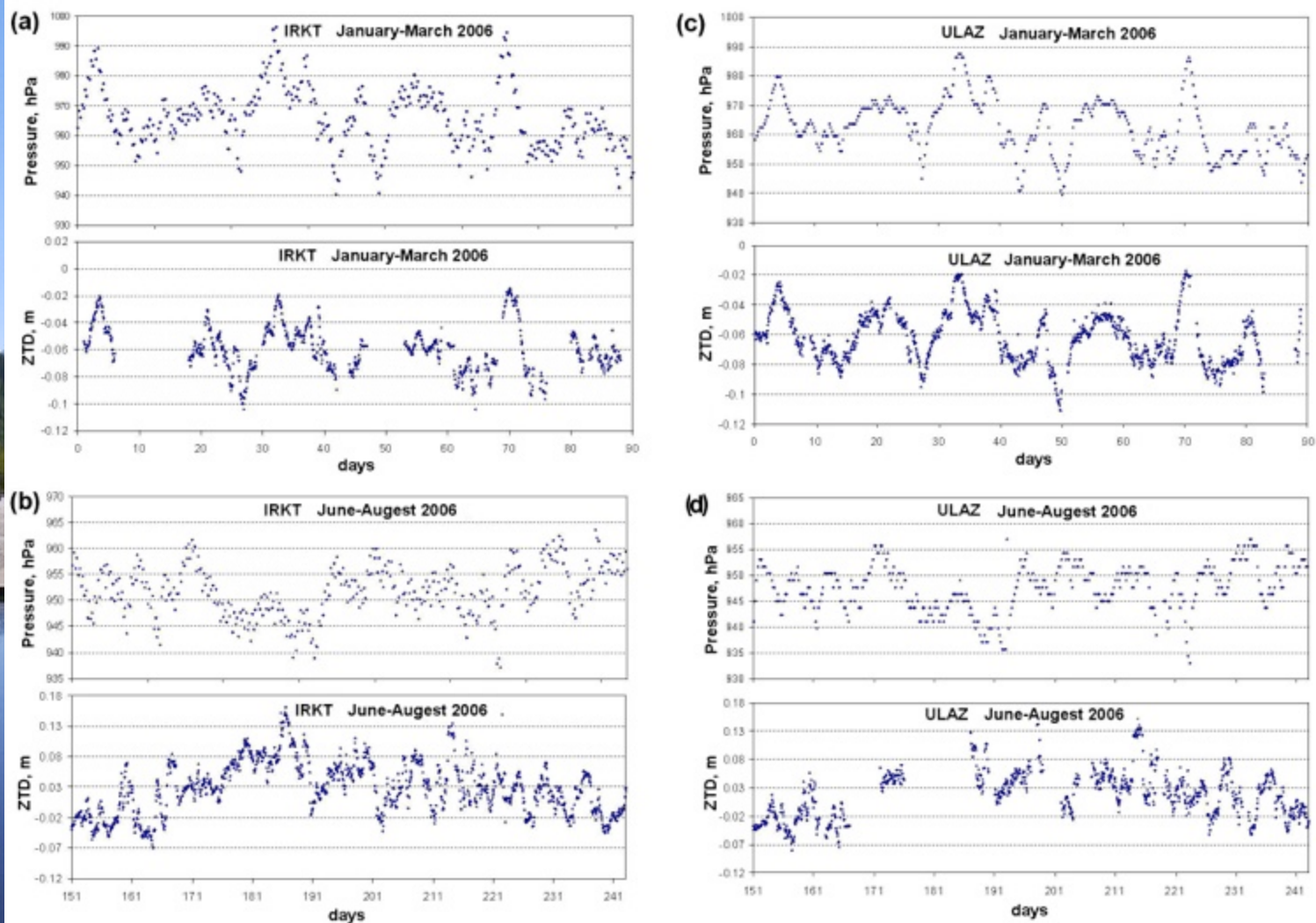


Fig. 4. Zenith troposphere delay and surface atmosphere pressure time series at IRKT (a,b) and ULAZ (c,d) GPS sites in the winter and summer period of observations.

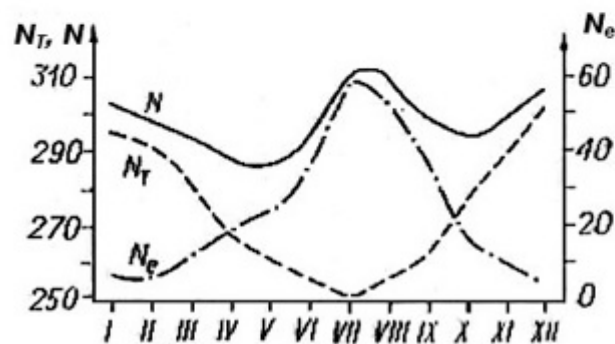
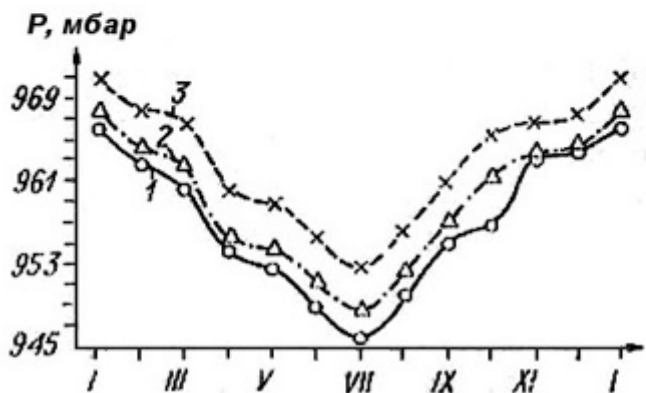
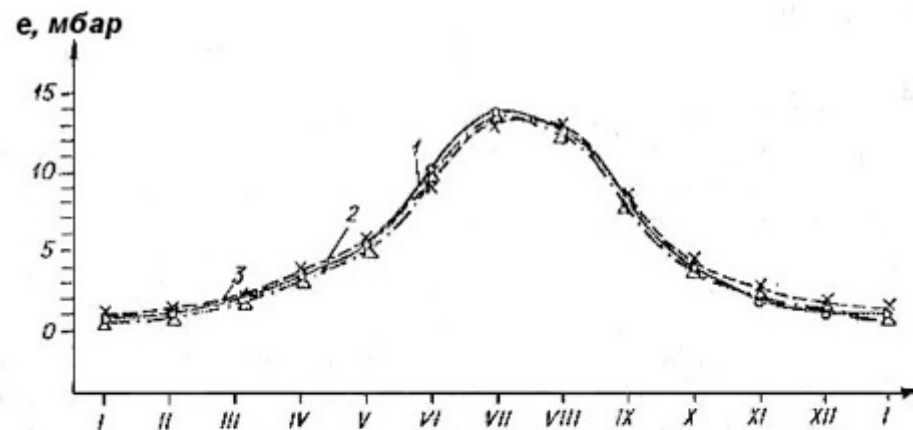
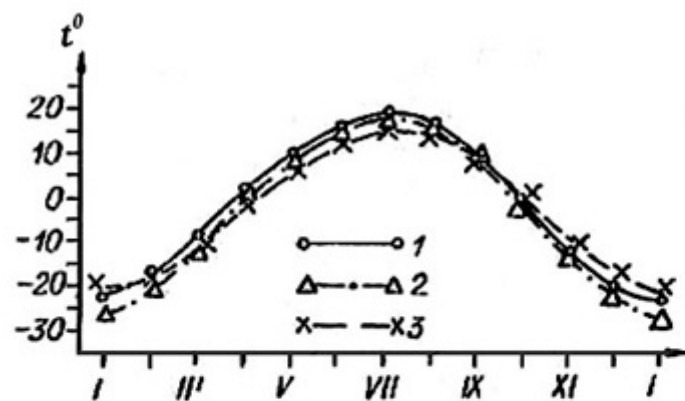


Fig. 5. Annual data of: a) temperature, b) humidity, c) atmosphere pressure on data of the hydrometeorology service of the Buryat Republic. (1- Ulan-Ude, 2 – Barguzin, 3 – Ust-Barguzin);
г) N_T and N_e on months for Ulan-Ude.

Conclusion

Quantity characteristics of the ZTD for GPS sites of ULAS and IRKT are determined.

The ZTD changed within $-0.18 \div 0.2$ m.

Minimum values correspond to autumn-winter-spring period, but maximum values correspond summer period.

Obtained results allow to create a regional space-time model of the ZTD.



The temporal GPS site on the South
of the Svetoy Nos Peninsula