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Ozone and UV-B monitoring in Tomsk, Central Siberia

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The total ozone observations by the Brewer MKIV 049 spectrophotometer in Tomsk, Central Siberia, have been conducted since 2003. The accuracy of routine total ozone observations at direct sun measurements is 2-3%. Under cloudless conditions at air mass factor less than 4, the accuracy of total ozone direct sun measurements approaches 1%, while the accuracy of direct moon observations is 2-4%. The Brewer instrument detected ozone anomaly at Tomsk station in April 2011. At this time the total ozone in the Arctic at Summit station in Greenland was 259 DU on March 28, 2011. Total ozone values in Scandinavia in the second half of March 2011 ranged from 255 to 285 DU at Sodankyla station in northern Finland, 248 DU on March 9, 2011 at the polar station Kiruna, Sweden. We are using the Brewer spectrophotometer for UV monitoring in Tomsk. In April 2005 and 2011 the instrument measured increased level of UV-B radiation at 300-315 nm. In accordance with the data obtained, there is a spring increase of daily income in the average annual behavior of UV-B radiation in April with the subsequent dip in the beginning of May. Also, the presence of fluctuations (one-two weeks) in daily income with typical peaks during summertime is observed. Maximal variability in spectral behavior was measured in the 295-310 nm range. The Brewer MKIV 049 spectrophotometer was calibrated 3 times in 2003-2008. The latest calibration was held in September 2012 using traveling standard spectrophotometer Brewer 017 from International Ozone Services Incorporated (IOS), Toronto, Ontario, Canada. IOS provides worldwide ozone and UV calibration services to customers with Brewer ozone spectrophotometer instruments. The result of the Brewer MKIV 049 total ozone measurements and observations of UV-B radiation in Tomsk, Central Siberia, in 2003-2012 will be presented and discussed.

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