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Ozone and inorganic halogens in surface air in Kalmykia during summertime

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Ozone in combination with nitrogen oxides (NO, NO2), submicron and soot aerosols, some VOC and inorganic halogens have been measured near village Godghur, Republic Kalmykia (Southern Russia) during several summer field campaigns since 1995. The last one took part in August, 2005 and unlike previous years it was characterized by prevailing air transport from the East directions. Kalmykia is the south-eastern part of Europe adjacent to the Caspian Sea. It has arid and semi-arid climate that favors to generation of reactive and toxic compounds if air pollution is high. Kalmykia has very few local industries and potential pollution sources but it is quite strongly influenced by industrial neighbor Russian and Ukrainian regions as well as by distant transfer of pollutants from Europe. There are also intensive sources of halogens and halogenated substances both on its territory and nearby such as salty lakes. Halogens transfer is likely to occur from the Central Asia with salt aerosols but during field campaigns in 2002 and 2003 when Cl and Br content was measured there were only few days with eastern air transfer. In this study we got possibility to compare influence of air coming from both western and eastern direction on tropospheric chemistry of Kalmykia using 5-day background trajectories calculated from NOAA/HYSPIT4 and from Russian Hydrometeorological Centre models. Ozone daily variations as well as ozone generation rate were compared for different types of background trajectories. They were also correlated with inorganic Br, Cl, F and I content in the air and in aerosol obtained from samples collected correspondingly on filter and on sorbet. Daily variations of submicron and soot aerosols, content in the air of heavy metals were taken into account under analyses either. Data analyses of the latest field campaign revealed higher halogens content in the air from SE direction enriched by salt aerosols from

the Caspian Sea and salty lakes of Caspian region and Central Asia. More intensive ozone generation rate - 6.0-8.5 ppbv/hour - was observed in the air of eastern directions. But maximal ozone generation rate equaled to 10.54 ppbv/hour was fixed when air originated from Europe had passed Volgograd region before coming to Goghur. Comparison of recent data with previous ones is given. The work has been done under support of ISTC Project N 2770