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The seasonal trend of the methane absorption in Southern hemisphere of Saturn

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In 1995, when the equator and rings of Saturn were oriented "edge-on", we have detected the strongly expressed N-S asymmetry of the optical characteristics of Saturn's atmosphere and clouds. There were significant differences in the latitudinal distribution of the methane absorption bands intensity as well as in the values of the limb darkening . The maximum of the methane absorption was related to the Northern hemisphere which was inclined towards the Sun during at least once 11 preceding years. However the limb darkening in the N-hemisphere was sharply decreased:, for instance, at 702 nm its value was about 0.75 instead of 0.90 and more for S-hemisphere. Our measurements of the CH_4 absorption bands profiles in visible and near IR spectrum were realized regularly during 1995-2006 by two ways. The first one used the CCD-spectra of the Saturn central meridian. The second was based on the number of zonal spectrograms of Saturn‘s disk recorded by scanning from S- polar limb to equator. General latitudinal variations of the methane absorption in the Southern hemisphere of Saturn are keeping during last years . The maximum absorption lies at latitudes about 15S – 20S deg in contrast with equatorial belt where the absorption sharply decreased. Small depression of the methane absorption has a place between 40S – 70S deg, but the absorption increases towards the South pole. The atlas of these data have been prepared and will be continued to get a full view of the changes in Saturn‘s atmosphere during 15 years. The seasonal variations of the methane absorption are evident**:** from the measurements of the CH_4 725 nm absorption band at temperate latitudes of the Southern hemisphere we have derived clear trend of its central depth R from 0.53 in 1995 to 0.74 at the end 2006. It may be approximately expressed as R(Y)= 0.530+0.019(Y-1995). We can be waiting that the latitudinal asymmetry of the methane absorption and other atmospheric characteristics on Saturn during next “edge-on” position in 2009-2011 will be reciprocal to observed in 1995.