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Long-term changes of the equivalent slab thickness of the ionosphere over Europe

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The equivalent slab thickness of the ionosphere is defined by the ratio of the vertical total electron content and the peak electron density. The equivalent slab thickness provides an easy measure of the width or shape of vertical electron density profiles which are very sensitive to temperature and composition changes in the thermosphere and to plasma redistribution processes. In this talk we present a long term trend analysis of the equivalent slab thickness of the ionosphere. The analysis is made for several vertical sounding stations located in Europe and covers the solar cycles 23 and 24.
As our studies have shown, the negative long-term trend of the equivalent slab thickness during solar cycle 23 range from about 11 up to 62 km/decade indicating a significant thermospheric cooling since 1995 when the observations started. We discuss these observations and related physics in the light of additional data covering the years 2010-2018. Our investigation shows that measurements of the equivalent slab thickness of the ionosphere can essentially contribute to monitor and better understand long term changes in the thermosphere-ionosphere systems.