



Magnetic states of the ionosphere of Venus

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Strong ultraviolet radiation from the Sun ionizes the upper atmosphere of Venus, creating a dense ionosphere on the dayside of the planet. In contrast to Earth, the ionosphere of Venus is not protected against the solar wind by a magnetic field. The combination of changing solar radiation and solar wind intensities leads to a highly variable structure and plasma composition of the ionosphere. The instrumentation of the Venus Express spacecraft allows to measure the magnetic field (MAG experiment) as well as the electron energy spectrum and the ion composition (ASPERA experiment) of the upper ionosphere and ionopause. Observations of MAG and ASPERA are combined to determine the position of the ionopause and its dependence on solar radiation and solar wind. The amplitude of the upstream solar wind dynamic pressure and the interplanetary magnetic field is expected to influence the magnetization depth of the ionosphere, thus leading to distinct magnetized and unmagnetized states. These states have been investigated using ASPERA and MAG data, and a further analysis of the magnetic field orientation will help to understand the underlying mechanisms. Furthermore, the intensity of photoelectrons is studied at altitudes above 180 km and the dependence of photoelectron transport on the magnetic structure is investigated.