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Magnetic field environment mapped by Venus Express magnetic field observation

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Although Venus has no intrinsic magnetic moment, the piled-up interplanetary magnetic field (IMF) forms a magnetic barrier in dayside to interact with the solar wind. This magnetic barrier, an induce magnetosphere on the dayside, acts as an obstacle to the solar wind in analog to the Earth's magnetosphere. The magnetic barrier is bounded by the ionopause at its lower boundary and a "magnetopause" at its upper boundary. Both ionopause and magnetopause extend to nightside. The magnetopause on the nightside separates the magnetosheath and magnetotail which is formed by the anchored, draped magnetic fields. In contrast to its unmagnetized state at solar maximum, the ionosphere appears to be completely magnetized and its upper boundary, the ionopause, significantly lowered. The magnetic draping configuration on the dayside becomes reverse draping on the night, forming a near toroidal magnetic field at low altitude. The launch of Venus Express provides a new opportunity to study the plasma environment of Venus. In this study, we examine various plasma boundaries and map the magnetic field environment of Venus in details.