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Kinetic properties of the interface between the solar wind and the magnetosphere of Venus and Earth: modeling and observations

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In June 2006 Venus Express crossed several times the outer boundary of the Venus induced magnetosphere, its magnetosheath and the bow shock. During the same interval Cluster spacecraft surveyed the dawn flank of the terrestrial magnetosphere, intersected the Earth's magnetopause and spent long time intervals in the magnetosheath. This configuration offers the opportunity to investigate simultaneously the interface between Venus and Earth's outer plasma layers and the shocked solar wind. We discuss the kinetic structure of the magnetopause of both planets, its global characteristics and the effects on the interaction between the planetary plasma and the solar wind. A Vlasov equilibrium model is constructed for both planetary magnetopauses and provides good estimates of the magnetic field profile across the interface. The model is also in agreement with plasma data and evidence the role of planetary and solar wind ions on the spatial scale and equilibrium of the magnetopause of the two planets.