THE VENUS SOLAR WIND INTERACTION -IS IT PURELY IONOSPHERIC? J. G. Luhmann[1], M. Villarreal[1], Y-J. Ma[2], C.T. Russell[2], H-Y. Wei[2], T-L. Zhang[3], [1]Space Sciences Laboratory, University of California, Berkeley, [2]IGPP, UCLA, [3]IWF, Graz.

The Venus solar wind interaction is regarded as the prototypical case of a flowing, magnetized plasma interacting with a planetary ionosphere. Yet there are some features of that interaction that remain incompletely understood-most notably the nightside ionospheric density 'holes' containing significant antisunward magnetic fields, and certain behaviors of the smaller scale ionospheric magnetic fields. Reanalysis of the observed Venus wake magnetic fields in the altitude range from its periapsis at ~150 km to ~500 km suggests the presence of a persistent radial magnetic field direction bias above ~250 km. The bias is hemispherically dependent, with more positive fields in the south and more negative fields in the north. We investigated how a weak, axially-aligned planet- centered dipole field would manifest itself under the high solar activity conditions that generally prevailed during the PVO sampling of these altitudes using the BATS-R-US MHD code. The model results show a bias of the radial field component similar to what is observed would be present in the solar wind interaction wake for a dipole of ~5 nT equatorial surface strength. This strength is higher by ~10x than that previously estimated from near-periapsis nightside radial magnetic field measurements. The role of the plasma interaction in affecting such estimates as well as other tests suggested by the model results may result in improved estimates of weak dynamo fields at Venus and other such weakly magnetic planetary bodies.