

On the scientific potential of field and wave measurements in Venus orbit

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The Venus ionosphere has been explored by a small number of spacecraft, most notably the Pioneer Venus Orbiter (PVO) that remained operational in orbit around Venus for more than a decade, 1978-1992. Although PVO collected a wealth of scientific data, its electric field receiver was only designed to collect amplitude information around four distinct frequencies. Many open scientific questions require more detailed field and wave measurements. These include, lightning emissions, their occurrence frequency and whether they are important to the atmospheric chemistry, VLF waves in the foreshock region, and the possible role of electric fields and waves in atmospheric escape. Simultaneous Langmuir probe measurement would make further diagnostics possible. We discuss the scientific potential of measuring electric and magnetic fields as well as doing Langmuir probe diagnostics on Venus orbiting spacecraft.