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# Very Long Baseline Interferometry for Planetary Science Studies

L.I. Gurvits (1) and S.V. Pogrebenko (1)

1. Joint Institute for VLBI in Europe, Dwingeloo, The Netherlands

(lgurvits@jive.nl)

Very Long Baseline Interferomtery (VLBI), a radio astronomy technique that offers the highest angular resolution and sensitivity, has progressed rapidly over the last years. It offers now a sub-kilometre-scale accuracy of position determination for weak transmitters at the distance of up to ten AU with minimal requirements for the composition of on-board instrumentation. Being combined with other advanced tracking techniques (such as DeltaDOR and two-way Doppler measurements), it brings about a possibility to conduct a variety of planetary science experiments with unprecedented accuracy. Recently the VLBI technique was demonstrated for the Huygens Probe during its descent in the atmosphere and on the surface of Titan. Similar experiments are being considered for a number of prospective planetary missions. In this review presentation we will discuss the basic principles of VLBI tracking of planetary missions. Major requirements and specifications for the on-board and Earth-based segments of VLBI tracking experiments will be presented. We will also describe several potential applications of this technique for various experiments in the interest of atmosphere physics, geodynamics and other planetary science disciplines. Another attractive potential of the technique links it with the general mission support as an efficient diagnostic and navigation tool. In the coming months and years a number of planetary missions will employ the VLBI technique and necessitate its further development. We will conclude the presentation with a brief outline of specifications of VLBI facilities that can be relied on by planetary missions in the coming 10-20 years.