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Venus and Mars Express spacecraft observations with Wettzell radio telescopes

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The ESA Venus and Mars Express spacecrafts were observed at X-band with the Wettzell radio telescopes Wn and Wz in a framework of the assessment study of the possible contribution of the European VLBI network to the upcoming ESA deep space missions and further projects. These observations were extended to regular weekly sessions to routinely run the processing and analysis pipeline. Recorded data were transferred from Wettzell to the JIVE cooperation partners for correlation and analysis. A high dynamic range of the detections allowed us to achieve a milliHz level of the spectral resolution accuracy and extract the phase of the spacecraft signal carrier line. Several physical parameters can be determined from these observational results with more observational data collected. Apart from other results, the measured phase fluctuations of the carrier line at different time scales can assess to determine the influence of the Solar wind plasma density fluctuations on the accuracy of the astrometric VLBI observations.

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