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Accurate spacecraft positioning by VLBI imaging

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VLBI is a radio astronomy tool with very high space angle resolution and Chinese VLBI Network has played a important roles in the Chang'E series lunar mission. In the upcoming Chinese lunar and deep space missions, higher angular position ability is needed. For these reasons, we carried out research on accurate spacecraft positioning and conducted several space vehicles phase-referencing positioning experiments using the Chinese VLBI network and other VLBI antennas. The near-field target uvw prediction method is adopted. This paper shows the VLBI spacecraft imaging position experiment results of several ChangE lunar probes, the Mars Express probe and the Rosetta probe. The results validate VLBI with the mill-arcsecond level position ability for deep space probes.

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