

Highly eccentric orbit determination using USB and VLBI

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Chang'e-1, Chinese first lunar exploration project, will mainly rely on Unified-S-Band (USB) equipment to complete satellite's tracking and controlling mission with Very Long Baseline Interferometry (VLBI) as complement. ChangE-1's phasing orbit is highly eccentric, which is similar to the orbit of TC1 satellite (part of Chinese-European double-star program). To validate the effect of this tracking mode, the test on USB and VLBI's jointly tracking TC1 was carried out on March 17-20, 2005. In this paper, the method for removing the spin signature for the S-Band range rate will be introduced. The measure model for VLBI will be constructed. Orbit determination modeling when combining USB and VLBI will be investigated. The precision of orbit determination and orbit prediction will be assessed. In the end, some useful conclusion will be drawn.