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INTERAGENCY CROSS-SUPPORT OF INTERFEROMETRIC TRACKING IN LONG RANGE GUIDANCE FOR LUNAR ORBIT RENDEZVOUS AND DOCKING

**Abstract**

In the lunar sample return mission, the long-range guiding technology plays an important role in lunar orbit rendezvous and docking between orbiter and riser. Compared with traditional ranging and Doppler measurement, interferometric tracking data are more sensitive to the angle separation between the two targets and more robust to the force model in the orbit determination. Thus, interferometric tracking, especially differential interferometric tracking, is very suitable for the case in lunar orbit rendezvous and docking, which needs the orbits to be determined rapidly and precisely to perform orbit maneuver continually in the lack of exact force model This article proposes the imagination of cross-support between agencies, using stations from different agencies, to provide precise differential interferometric tracking data to meet the requirement in lunar orbit rendezvous and docking. Based on the characteristics of interferometric tracking, cross-support will provide better observing geometry. What's more, cross-support will greatly enlarge the observing chance for the lunar targets, which means that targets could be interferometrically tracked almost at any time as long as they are visible to the earth. This will be very benefit for lunar orbit rendezvous and docking. Superiority of cross-support in terms of observing geometry and observing chance is analysed in details, and the interoperation modes between agencies are discussed.