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AN IMPROVED ALGORITHM OF DOR PROCESSING FOR DEEP SPACE SPACECRAFT
NAVIGATION**Abstract**

Very Long Baseline Interferometry (VLBI) has the advantages of high resolution, high accuracy and it has been successfully used in many deep space exploration projects over the past decades. It does not lose sensitivity to spacecraft declination when the spacecraft is near earth's equatorial plane, as is the case for doppler tracking. Usually spacecraft transmits high frequency single tones which can be used for Differential One-Way Ranging (DOR) tracking. It can improve the accuracy of delay through wide spanned bandwidth. For the navigation of China CE3 by China Deep Space Net and ESA, algorithm of data processing is tested. In this paper, performance of DOR tracking for Venus Express is analyzed, data was recorded by station Cebreros and station New Nocia. We present a new algorithm based on model reconstruction, which is still effective when spacecraft has large delay and fast movement. Combined with high accurate orbit information, the accuracy of delay is in the order of ns and delay rate is in the order of ps/s. The algorithm will play an important role in CE3 navigation.