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The Project and plan of ground-satellite Laser Time Transfer in China

The first mission of Chinese Laser Time Transfer (LTT) between ground and Chinese Navigation Satellites was successfully implemented by Shanghai Astronomical Observatory of Chinese Academy of Sciences. The time difference was obtained with the single shot precision of about 300ps, and time stability of 20ps @ 500s. With the high speed development of frequency standard, high stability and accuracy of time transfer is demanded. A new laser time transfer plan is in process on satellite of the orbit of around 400km, with time comparison single shot precision of 60ps, stability of less than 1ps @ 300s, and 1ps @ 1day. Now the system is in design. This paper introduced the consideration of the detector and timer, the optical design, some measuring results of the system stability, the challenge, and next plan of the design work.