

Advances in Daytime Debris Laser Ranging(DLR) Technology on the Changchun Station

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Changchun Station, focusing on kHz satellite laser ranging and daytime ranging technologies, recently conducted Debris Laser Ranging (DLR) experiments on 532nm and 1064nm platforms, by successfully utilizing several key technologies. Among these developments, we developed low-noise, low-jitter 1064nm infra-red APD single-photon detector. The station has also realized daytime ranging of space debris at near-infrared wavelength; however, the maturity of daytime DLR technology and system automation are left for further improvement. Several new techniques for debris ranging, including real-time estimation of daytime background noise and range gate width adaptation, are currently under experiment. These advances are expected to enhance the station's space debris ranging capability and accuracy, to pave the way for the application of small-size, all-day DLR technology.