

Design and Manufacture of Laser Retro-reflector Arrays for LEO and HEO Satellites at Shanghai Astronomical Observatory

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The first set of Laser Retro-reflector Arrays (LRA) was successfully made and onboard Chinese spacecraft at the altitudes of 330km by Shanghai Astronomical Observatory (SHAO) in 2002. Up to now SHAO has designed more than twenty sets of LRA for the Chinese-made satellites with different orbital altitudes of 330-36000 km. The smallest LRA for LEO was 400 grams and the largest one for GEO was 4.85 kg. The effective reflective area is from less than 8 cm² to near 800 cm². And two sets of LRA onboard LEO have been exported to South Korea. SHAO have also manufactured LRA for laser radar at the mission of Chinese first spacecrafts docking to measure the distance between two docking spacecrafts. All LRA are passed the space environmental simulation testing to insure the stability of products. It has been shown from the measuring results that the performances of LRA are good.