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Optical Tests of a Large Number of Small COTS Cubes

The use of small Commercial off-the-shelf (COTS) cubes for future satellite missions appears attractive for their comparatively low price per piece and ready availability in comparison to specifically manufactured prisms with tight specifications. The question arises if the optical quality of such COTS cubes meets the requirements of satellite laser ranging. The Institute of Aeronautics and Astronautics of Technische Universität Berlin recently purchased nearly 100 coated 10 mm cubes from a Chinese manufacturer for use in several nanosatellite projects. All samples were optically tested at GFZ Potsdam for their FFDPs. Additionally; ZYGO interferometric data for dihedral angle offsets are available for 32 samples. Tests of “absolute” effective cross section with respect to a reference flat were performed for selected samples from the overall set. The results allow for collecting statistics about manufacturing tolerances and optical quality of the tested COTS cubes.