

## Updated Centre of Mass corrections for LAGEOS and Etalon

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One of the enduring limiting factors in reaching the scientific goal of 1-mm accuracy satellite laser ranging to the geodetic satellites is the problem of referring the range observations to the centres of mass (CoM) of the spherical satellites. The cube-corner retroreflectors that are densely distributed over the surfaces of the primary geodetic satellites LAGEOS (diameter 0.60m) and Etalon (diameter 1.29m) give rise to broad, complex distributions in the returning laser pulses that are detected by the stations. Proper treatment of the resulting range measurements that take account of the various laser-station technologies is required in order to minimize potential systematic errors in the range that can reach more than 10 mm for the two LAGEOS and up to several cm for the two Etalon satellites. Earlier theoretical results (Otsubo and Appleby, JGR, 2003) have been used to develop tables of CoM corrections and their uncertainties that are applicable in a simple way when analyzing range data from all the ILRS stations that have operated from 1980 onwards. We outline the results and discuss their impact upon weekly reference frame solutions contributed by the Herstmonceux AC to a pilot study organized by the ILRS Analysis Working Group.