

LUNAR MOMENT OF INERTIA CONSTRAINTS FROM LUNAR LASER RANGING,  
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Among the parameters being determined by the Lunar Laser Ranging Experiment are the lunar moment of inertia parameters  $\beta = (C - A)/B$  and  $\gamma = (B - A)/C$  and some of the third degree gravitational harmonics. Combining the most recent laser ranging determined values of  $\beta = 631.1 \pm 0.4 \times 10^{-6}$  and  $\gamma = 226.8 \pm 1.0 \times 10^{-6}$  with a lunar orbiter value of  $\bar{J}_2 = 204 \pm 3 \times 10^{-6}$  gives the moment of inertia constraint  $C/MR^2 = 0.394 \pm 0.006$ . Virtually all of the uncertainty in the last value comes from  $J_2$ . Differencing the ranges between the different lunar reflectors allows the lunar physical libration parameters and the differential lunar reflector coordinates to be determined to very high accuracy with little corruption due to lunar orbit or earth related quantities. Such solutions will be discussed.