

CCD Observations of Asteroid 1998 SF36 (25143)

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Asteroid 1998 SF36 (25143) is the target of the Japanese/NASA MUSES-C sample return mission, set for launch in 2002. The preparation and planning for this mission requires prior knowledge of the physical parameters of the intended target. Such knowledge is valuable in planning the mission trajectory and science scenarios. This near-Earth asteroid was fortuitously placed for observations in 2001 when it approached to within 0.038 AU of the Earth. We present results of a ground-based observational study of 1998 SF36, consisting of multi-filter CCD photometry and low resolution CCD spectroscopy, from which the asteroid's rotation period, axial ratios, broadband colors, and taxonomic classification are derived. CCD photometry was obtained during March and August 2001 using the 24" telescope at Table Mountain Observatory and the 60" telescope at Palomar Observatory, respectively. Analysis of the August BVRI filter photometric data is ongoing. However, analysis of the March data reveals a rotation period of approximately 12.1 hours, with an associated peak-to-peak amplitude of 0.69 magnitudes, suggesting a highly elongated object. The measured color indices are 0.87 ± 0.06 (B-V), 0.49 ± 0.13 (V-R), and 0.28 ± 0.22 (R-I). Complimentary, low resolution, spectroscopic observations between 0.35 and 1.0 microns were obtained with the 5m Hale telescope at Palomar Mountain on March 17 and 18, 2001. The spectra indicate that this object is most likely of QRS-type, similar to ordinary chondrite meteorites. This work was supported in part by the NASA Planetary Astronomy Program. Financial assistance from the National Research Council is gratefully acknowledged.