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SMART-1 & recent missions: results from combining data

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Abstract

We highlight some results from combined data analysis using SMART-1 archive with other recent lunar missions. We discuss in particular impact craters, volcanic, photometry and studies of ILEWG sites.. SMART-1 demonstrated the use of Solar Electric Propulsion for deep space, tested new technologies for spacecraft and instruments miniaturisation, and provided an opportunity for science [1-12] until impact on 3 September 2006. To date 75 refereed papers and more than 325 conference or technical papers have been published based on SMART-1 (see ADS & SMART-1 website sci.esa.int/smart-1 or www.esa.int/smart-1). The SMART-1 data are accessible on the ESA Planetary Science Archive PSA [13] http://www.rssd.esa.int/psa

1. Recent SMART-1 archive results

These include: multi-angular photometry of Mare and specific regions to diagnose the regolith roughness and constrain models of light reflection and scattering [14] and comparison to laboratory granular photometric studies [15]; the lunar North and South polar illumination was mapped and monitored over the entire year, permitting to identify "SMART-1 peaks of quasi-eternal light" and study their topography [16, 17]; SMART-1 was used for radio occultation experiments [18], positioning reduction of SMART-1, Change'E1 and 2 VLBI tracking data [19]; the X-Ray Solar Monitor studied the Sun as a flare star with GOES and RHESSI [20,21]; SMART-1 SIR and Chandrayaan-1 HySI were used to study the composition of the central peak of craters [22]; the SMART-1 impact observed from Earth was modeled using laboratory experiments [23].. The South Pole Aitken Basin was mapped and studied combining data from Clementine, SMART-1, and other missions [24]. The SMART-1 archive observations have been used to support Kaguya, Chandrayaan-1, Chang'E 1, the US LRO and to characterise potential sites for lunar science and exploration.

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