



Development of the Faraday cup instrument BMSW-LG for the Moon orbiter Luna-Resurs-1

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BMSW-LG instrument of the Russian Luna-Resurs-1 (LROA) mission is an extension of the fast solar wind monitor BMSW successfully working six years onboard the Russian Spektr-R satellite. One of the scientific goals of the LROA satellite is an in-orbit investigation of the lunar exosphere including plasma and dust at altitudes ≈ 65 and 150 km above the Moon surface, related to the dynamical solar wind environment. The instrument consists of two blocks: the main one for almost permanent solar wind monitoring (6 FCs) and the complementary one for registration of the ions reflected from the surface and/or magnetic anomalies (2 larger FCs), utilizing altogether eight newly designed Faraday cups with divided collectors. The main block of BMSW-LG will perform simultaneous measurements of a solar wind full energy distribution function and helium abundance (with 3-s time resolution) and determination of plasma moments with the time resolution of 32 Hz under a Maxwellian approximation. The second block with a wide nadir-oriented view angle is supposed to provide energy distributions of reflected ions with 6-s time (≈ 10 km space) resolution and to estimate the integrated UV flux reflected from the lunar surface. In the contribution, we describe the BMSW-LG design and we report on simulations of the Faraday cup characteristics and removal of photocurrent modulated by the UV reflected from the Moon. We also assess the capabilities of the instrument to register dust particles in the lunar environment.