

The camera of the MASCOT lander onboard Hayabusa 2: Planning for the landing on asteroid Ryugu

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The JAXA Hayabusa 2 spacecraft is scheduled to arrive in April 2018 at 162173 Ryugu to start its year-long mission near the asteroid. On-board is the Mobile Asteroid Surface Scout (MASCOT), developed by the German space agency (DLR) with major contributions by the French space agency (CNES) [1]. MASCOT will be ejected towards the surface in October 2018 to land around noon local time. Ryugu is of the rare spectral type Cg, with reflective properties of both the C and G-type asteroids [2]. The MASCOT mission at Ryugu is to study the surface of this small, enigmatic asteroid up-close with its four instruments. Images acquired by the MASCOT camera will contribute to this goal by characterizing the physical and reflective properties of the regolith at high spatial resolution, providing the ground truth for the remote observations by the Hayabusa 2 instruments, and providing context and guidance for the Hayabusa 2 sampling effort. The camera has a 54.5° field-of-view and is equipped with an LED array of 4 different colors to illuminate the surface at night [3]. The MASCOT mission is expected to last about two asteroid days and nights, depending on the on-board battery performance. Several mission phases can be distinguished: (1) descent, landing, and uprighting, (2) afternoon of day 1, (3) night 1, (4) day 2, (5), night 2, and (6) day 3. We describe the camera imaging plans for each of these phases in detail.

[1] Ho, T.-M. et al. (2016), SSR, DOI 10.1007/s11214-016-0251-6, [2] Binzel, R. P. et al. (2002), in Asteroids III, ed. W. F. Bottke et al., 255, [3] Jaumann, R., et al. (2016), SSR, DOI 10.1007/s11214-016-0263-2.