

Opportunity Completes Atmospheric Science Campaign At Erebus

December 20 2005



Opportunity successfully deployed its robotic arm on sol 671 (Dec. 13, 2005) and used it to position the microscopic imager. The cause of a shoulder-joint motor stall during an attempt to deploy the arm on sol 654 appears to be a broken wire in the motor windings.

The motor can still be operated by changing one of the parameters so that more current is delivered.

However, the behavior is still being characterized, and stalls of the motor can still occur while the motor parameters are being adjusted. Analysis also continues for determining the best strategy for keeping the arm unstowed even when it is not in use, so that the arm could still position instruments on targets even if the motor with the broken wire becomes unusable.

While parked at "Erebus Crater," Opportunity has completed a campaign of atmospheric science, with sky surveys, photometry observations at several times of day, and atmospheric observations with the miniature thermal emission spectrometer. The rover also observed ground targets with the panoramic camera and the miniature thermal emission spectrometer.

Sol-by-sol summaries

Sol 668 (Dec. 10, 2005): The team had planned some targeted remote sensing and atmospheric observations, but the plan did not get uplinked due to issues with ground servers.

Sol 669: The uplink succeeded, and Opportunity performed targeted remote sensing and atmospheric observations.

Sol 670: Early in the morning, the rover performed an atmospheric observation. Later in the day, some stares with the miniature thermal emission spectrometer were completed.

Sol 671: Results of diagnostic tests of the robotic arm were consistent with the performance of a motor with a broken wire in one of the windings. The motor can be operated in this configuration by modifying motor parameters. By making the necessary changes, the arm was successfully moved out of its stowed position.

The team planned a two-image-by-two-image mosaic with the microscopic imager and a reading with the Moessbauer spectrometer. The first half of the mosaic completed as planned, but the arm sequence was halted after that due to a stall of the shoulder-joint motor.

Sol 672: Opportunity made atmospheric and photometric observations.

Sol 673: The plan was to complete the microscopic-imager mosaic that was started on sol 671 and place the Moessbauer spectrometer on a target called "Williams." However, the shoulder-joint motor stalled once again. Targeted observations with the panoramic camera were completed as planned.

Sol 674 (Dec. 16, 2005): After analysis of the sol 673 stall, the team redelivered a command sequence to close the microscopic imager's dust cover and to position the alpha particle X-ray spectrometer for an overnight integration on Williams. Opportunity's total odometry remains at 6,502 meters (4.04 miles).

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