



The Science Mission of the SpaceIL Lunar Lander

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The SpaceIL mission is a lander named Beresheet originally conceived as a contender in the Google Lunar X-Prize competition with an objective of landing on the Moon, transmitting images and collecting information on the surface. In addition to a suite of cameras, the mission has integrated a scientific payload consisting of a small Lunar Retroreflector Array (LRA, provided by NASA Goddard) and a 3-axis, fluxgate magnetometer (SILMAG, provided by UCLA). Correspondingly, the science mission of SpaceIL consists of detailed characterization of the landing site, measuring the crustal magnetic anomalies to constrain their possible origin and longevity of the lunar dynamo, and localization of the lander using ranging to the LRA. Orbital measurements of the magnetic field from Kaguya and Lunar Prospector guided the selection of the final sites to a location West of Posidonius crater, where the magnitude of the magnetic field reaches 8-10 nT. SpaceIL will acquire three-axis field measurements during landing, which should enable reconstruction of the crustal field variations and finer scales as the spacecraft approaches the ground. Data acquisition is planned during orbit and landing trajectory, providing a unique data set at low altitude. Below 10 km altitude, high resolution measurements are available only from the Lunokhod 2 rover. We plan to use this data to associate the anomalies with geologic features on the surface, and thus probe the genesis of the remnant magnetization. We plan to present the various data acquired by the spacecraft planned for launch in February 2019.