

IAF SPACE EXPLORATION SYMPOSIUM (A3)

Moon Exploration – Part 1 (2A)

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ALINA-2: INNOVATIONS ON PTSCIENTISTS' COMMERCIAL LUNAR LANDER

Abstract

PTScientists GmbH is developing a second iteration of our lunar lander called ALINA-2. With a wet mass of approximately 4 tonnes, ALINA-2 will be capable of transporting 300 kg of commercial payloads from GTO to the lunar surface. Several key enabling technologies are employed on ALINA-2. These include a 4 kN propulsion system which provides the necessary thrust for the Power Descent Maneuver (PDM) to the lunar surface and a total v of 3700 m/s for all maneuvers. The motors can be pulsed to vary the thrust level and improve the controllability of the lander. During the PDM, ALINA-2's GNC utilizes a combination of radar, laser altimeters, and crater navigation technology to facilitate a soft and accurate landing. Carbon fibre reinforced polymer is used strategically to lower the weight of ALINA-2's main structure and landing legs, while phase changing materials are employed on units with high heat loads. In addition to hosting a wide variety of commercial payloads, the lander will deploy two nearly identical Audi lunar quattro (ALQ) rovers equipped with LTE transceivers. ALINA-2 will use an LTE base station to communicate with the rovers, allowing ALQs to stream HD video back to Earth. The rovers will investigate the "orange soil" at the Short Crater and will visit the Apollo 17 landing site.