

SPACE EXPLORATION SYMPOSIUM (A3)  
Moon Exploration – Part 2 (2B)

Author: Dr. Gwanghyeok Ju

Korea Aerospace Research Institute (KARI), Korea, Republic of, ghju@kari.re.kr

Dr. Dong-Young Rew

Korea Aerospace Research Institute (KARI), Korea, Republic of, dyrew@kari.re.kr

Mr. Sang-Wook KANG

Korea Aerospace Research Institute (KARI), Korea, Republic of, kangsw9@kari.re.kr

Mr. Sung-Soo Jang

Korea Aerospace Research Institute (KARI), Korea, Republic of, ssjang@kari.re.kr

Dr. Su-Kyum Kim

Korea Aerospace Research Institute (KARI), Korea, Republic of, skim@kari.re.kr

Dr. Jae Hyuk Lim

Korea Aerospace Research Institute (KARI), Korea, Republic of, ljh77@kari.re.kr

Dr. Do-Soon Hwang

Korea Aerospace Research Institute (KARI), Korea, Republic of, dshwang@kari.re.kr

Dr. Myoung-Jong Yu

Korea Aerospace Research Institute (KARI), Korea, Republic of, mjyu@kari.re.kr

Dr. Sang-Ryool Lee

Korea Aerospace Research Institute (KARI), Korea, Republic of, leesr@kari.re.kr

## KOREAN LUNAR LANDER DEMONSTRATOR DEVELOPMENT

**Abstract**

Asian neighbors Japan, India and China launched lunar exploration satellites into orbit recently and are planning to launch lunar landers on the moon surface in early 2010s with the ultimate vision of human lunar exploration. Korea is also planning to send a lunar exploration module in 2020s, while a launch of a manned Korean spacecraft is unthinkable thus far. Under the supervision of the MEST (Ministry of Education Science and Technology), KARI (Korea Aerospace Research Institute) has conducted the study on establishing a preliminary plan for the national space exploration including unmanned lunar exploration activities. In addition, internal research activities have been done since 2010 for the conceptual study of lunar orbiter/lander prototype as well as lunar lander demonstrator development. In this paper, updated outcome of the conceptual study for Korean lunar orbiter/lander prototype presented. Firstly, the feasible mission strategies for Korean unmanned lunar exploration are refined in terms of optimal launch time selection and fuel consumption, etc. structure and propulsion subsystem conceptual design results to satisfy the launch capabilities of the planned KSLV-2(Korea Space Launch Vehicle-2) and mission scenarios are introduced. Each subsystem design includes trade-study to find optimal solutions with actual constraints such as mass and size, etc. Thirdly, conceptual design outcome for attitude control, power, data handling, TTC(telemetry and telecommand), and RF is also introduced with trade-off study for component selection and In addition, KARI is also developing a ground-based lunar lander demonstrator associated with a lunar mission simulator to demonstrate lunar landing technologies. Updated design features are also presented in this paper with focusing on its design concept, HILS based test scenario with lunar simulator, etc. In conclusion, the outcome of this conceptual study and lunar lander demonstrator development can be extended to provide a proper guideline and input for the planned Korean unmanned

lunar exploration in 2020s.