

SPACE PROPULSION SYMPOSIUM (C4)
Propulsion System (1) (1)

Author: Mr. Yasuhito Kano

Japan Aerospace Exploration Agency (JAXA), Japan, kanoh.yasuhito@jaxa.jp

Mr. Takeshi Tsujimoto

Japan Aerospace Exploration Agency (JAXA), Japan, tsujimoto.takeshi@jaxa.jp

Mr. Isao Kubota

Japan Aerospace Exploration Agency (JAXA), Japan, kubota.isao@jaxa.jp

Mr. Takao Munenaga

Japan Aerospace Exploration Agency (JAXA), Japan, munenaga.takao@jaxa.jp

Mr. Masahiro Ishii

IHI Aerospace Co, Ltd., Japan, masahiro-ishii@iac.ihl.co.jp

Mr. Yutaka Sato

IHI Aerospace Co, Ltd., Japan, y-yutaka@iac.ihl.co.jp

OVERVIEW OF LNG PROPULSION SYSTEM DEVELOPMENT

Abstract

As for propellant of liquid propulsion system, although hydrogen takes advantage of the high performance, liquid natural gas (LNG) has merit for the less evaporation in space, high density and so on. LNG propulsion system, which uses a combination of liquid oxygen and liquid natural gas, is being developed in Japan.

We have developed 100kN-class LOX/LNG upper stage engine for a middle-class launch vehicle. The engine consists of pump-feed system and ablative chamber. Full duration firing tests with the prototype engine were successfully completed in 2009 and the results showed that the engine design was almost fixed.

Also, we make efforts to attract the potential to enlarge the application of the technology to various space transportation systems. We develop the 30kN-class LOX/LNG engine based on the technology of 100kN-class engine. Firing tests in 2011-2012 demonstrate that the engine is accomplished high performance.