

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

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DEVELOPMENT OF NEW TECHNOLOGIES APPLIED TO LOX-CH<sub>4</sub> PROPULSION**Abstract**

Different programs are under development in Avio to increase the knowledge about LOx/CH<sub>4</sub> propulsion. In particular technologies for upper stage and thrusters have been identified. For what concern upper stage propulsion, under LYRA Program founded by ASI and with ASI-Roscosmos Agreement, a 10 ton class engine (LM10 MIRA) demonstrator has been studied by AVIO-KBKhA propulsion team. Experimental activities on injector head and turbopump have been performed in order to verify the sub-system functioning prior to perform test at engine level. In particular following activities are recalled: full-scale cold flow and hot firing test of injector head with the trust chamber, fuel turbopump sub-system test (i.e. pump water test, air turbine performance test of turbine and bearing verification). For what concern thruster propulsion, under THESEUS Program, a 200N class new thruster demonstrator (for RCS application) has been designed up to Preliminary Design Review. Technologies under development regard ablative thrust chamber, capability to function in pulsed and steady-state mode with high reliable ignition system. Finally further steps of development up to firing test of LM10 MIRA and thruster demonstrators are presented.