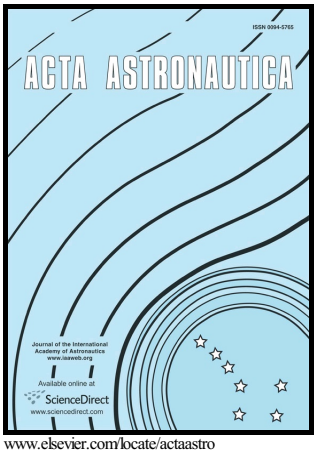

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Concept of a Self-Pressurized Feed System for Liquid Rocket Engines and Its Fundamental Experiment Results ☆

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Abstract

A new propellant feed system referred to as a self-pressurized feed system is proposed for liquid rocket engines. The self-pressurized feed system is a type of gas-pressure feed system; however, the pressurization source is retained in the liquid state to reduce tank volume. The liquid pressurization source is heated and gasified using heat exchange from the hot propellant using a regenerative cooling strategy. The liquid pressurization source is raised to critical pressure by a pressure booster referred to as a charger in order to avoid boiling and improve the heat exchange efficiency. The charger is driven by a part of the generated pressurization gas using a closed-loop self-pressurized feed system.

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