

IAF SPACE PROPULSION SYMPOSIUM (C4)
Late breaking abstracts (LBA)

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CONTROLLED COMBUSTION OF SOLID ROCKET PROPELLANTS WITH
ELECTROMECHANICAL SUBSYSTEMS**Abstract**

Solid propulsion has been an intrinsic part of space propulsion until the introduction of the complicated liquid propulsion systems. A new groundbreaking solid propulsion system that is capable of varying the thrust and pausing the combustion process in case of emergency is being proposed by a team of students from Sri Sairam Engineering College, India.

This model uses solid fuel comprising of potassium nitrate and sugar as primary fuel composition equivalent to E-45 rocket boosters with grade 304 stainless steel motor components. Combustion is controlled by concentric control shafts present in the chamber, which vary the combustion area and, ultimately, vary the thrust output. The efficiency and operability of the proposed system have been validated with high quality combustion simulation software, demonstrating that controlled solid propulsion is possible through the use of electromechanical subsystems, Thus reducing cost, risk of damage and complexity while achieving higher performance characteristics.