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FLUID FLOW-RATE CONTROL VALVE

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Space rocket engineering is getting more and more popular among young people. A lot of student organizations are developing in this direction. Some projects designed by these student organizations take part in various space rocket engineering forums. Most student rockets are designed for the certain trajectory of a rocket flight.

To solve this task the authors suggest using thrust vector control system. Module control and thrust vector direction control of a rocket engine are carried out both by turning the engine bay in two degrees of freedom and fluid flow-rate control by means of a special valve. Flow-rate control through the valve is adjusted due to the rotational mechanism and because of this the thrust vector module value would change.

Priority directions in fluid flow-rate control valve are reliability, scalability and simplicity. Initially this system is designed for the certain rocket developed by the design bureau RocketLAV at Samara University.

The first designed variant of the thrust vector control system would consist of the valve, the nozzle and the main case mounted at the low rocket part. The authors have planned tests to develop the system. Further flight model tests are also planned to determine disadvantages that could not be considered at the design stage.