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Novel Injection Manifold Design for Rotation Detonation Engines

Tesla-valve injector stabilizing rotating detonation engines by reducing backflow and boosting longevity.

Researchers at Purdue University have developed an injection manifold for use in rotation detonation engines (RDEs) that can be integrated into existing systems to reduce backflow and instability. In RDE systems, the pressure waves associated with detonation travel too quickly for conventional valve designs, causing the flow through the fuel and oxidizer injectors to reverse. Purdue's system leverages tesla-valve based injectors that can be achieved via additive manufacturing techniques. This technology has applications in rocket propulsion or any fields where RDEs are used.

Advantages

- Improved stability, reduced backflow

- Can be integrated into existing systems

- Better engine longevity and performance

Applications

- Rotating Detonation Engines

- Rocket propulsion

- Combustion

Technology Validation:

This technology is still in the conceptual stages.

TRL: 2

Intellectual Property:

Technology ID
2021-QIAO-69271

Category
Aerospace & National Security/Aviation
Aerospace & National Security/Hypersonics & Propulsion Systems
Automotive & Mobility Tech/Fuel Injection & Combustion Control Systems

Authors
Li Qiao
Qili Liu

Further information
Matt Halladay
MRHalladay@prf.org

View online

Design Patent, 2020-12-17, United States

Provisional-Patent, 2020-12-17, United States

Utility Patent, 2021-12-16, United States

CON-Patent, 2023-09-26, United States

Keywords: rotating detonation engine,tesla valve injector design,additive manufactured injectors,rocket propulsion stability,combustion backflow reduction,advanced propulsion technology,detonation wave management,integrated RDE injectors,engine longevity improvement,high performance aerospace engines