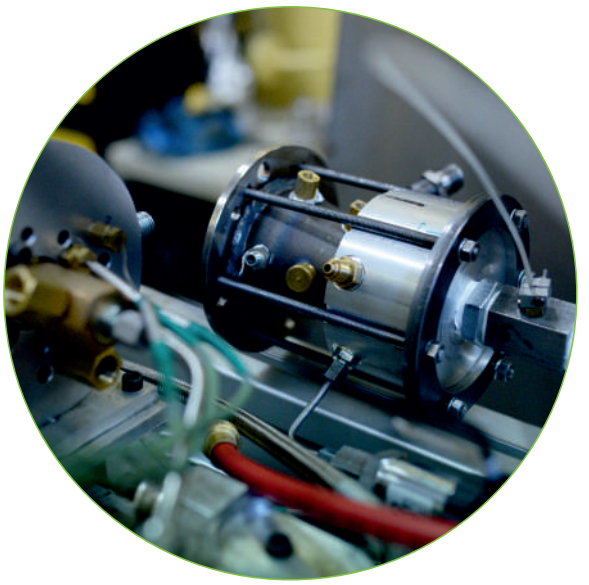
Łukasiewicz
Institute
of Aviation

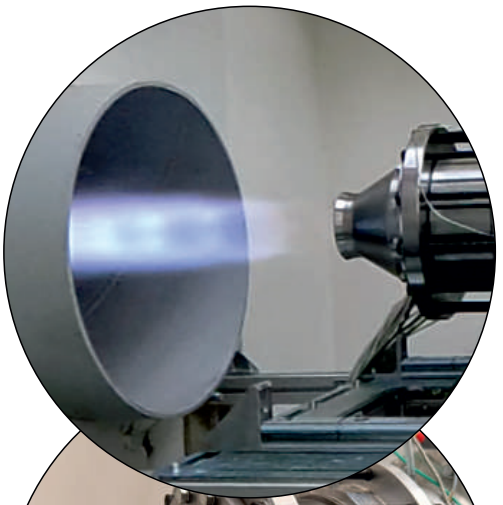
Innovative propulsion offering
benefits in efficiency,
environmental impact, and cost

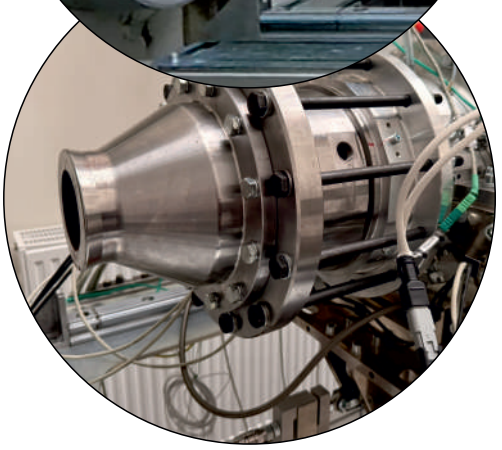
# ROTATING DETONATION ENGINE

# CHARACTERISTICS

The Rotating Detonation Engine (RDE) uses a detonation wave that propagates in an annular combustion chamber, allowing the technology to be applied in ramjet, turbine and rocket engines. This solution increases the thermodynamic efficiency of the propulsion system, resulting in lower fuel consumption, a potential reduction in exhaust emissions, as well as reduced engine weight and size.







# KEY FEATURES

- Up to 15% higher thermodynamic efficiency compared with conventional propulsion systems.
- Increased cruising speed or range.
- Compact and simple design, ensuring high reliability and lower propulsion system costs.

# PORTFOLIO

- **Ramjet engine with a rotating detonation combustor,** powered by aviation kerosene and designed for use in supersonic missiles (TRL 4).
- **Air-breathing turbine engines with rotating detonation combustors,** powered by hydrogen and designed for turbine propulsion systems (TRL 4).
- **Liquid-propellant rotating detonation rocket engines (TRL 6).**

# POSSIBLE APPLICATIONS

- **Space Industry:**
  - Environmentally friendly rocket propulsion.
  - Engines for spacecraft and interplanetary probes.
- **Defense Industry:**
  - Cruise missiles and other advanced weapon systems.
  - Rocket missiles capable of achieving supersonic and hypersonic speeds.

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