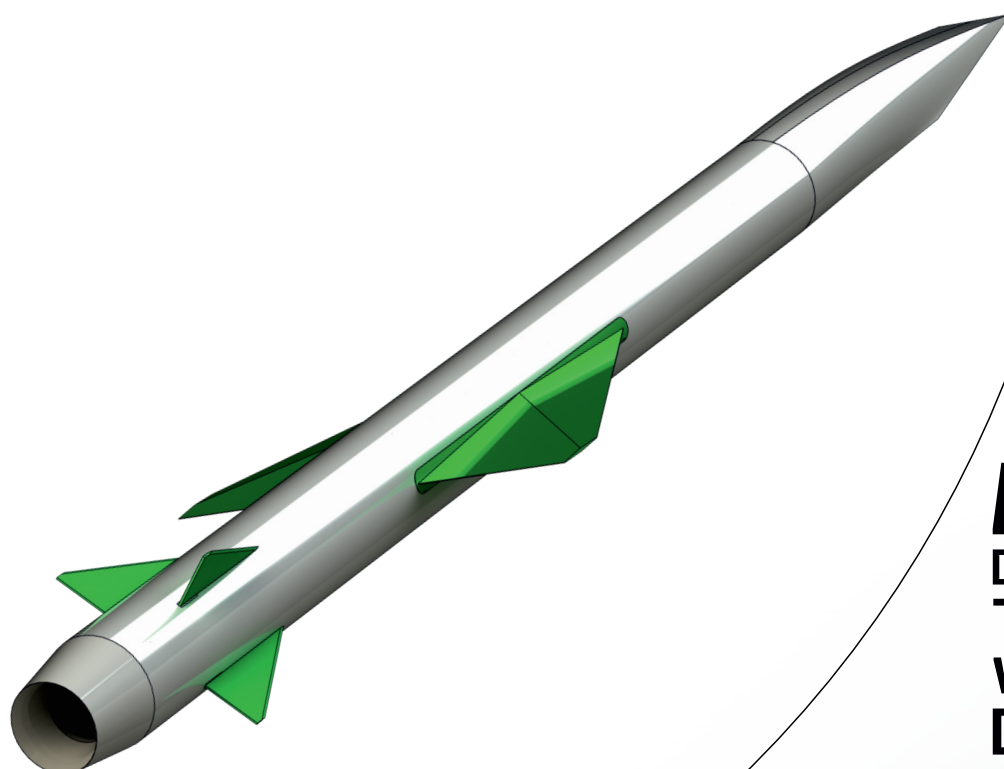
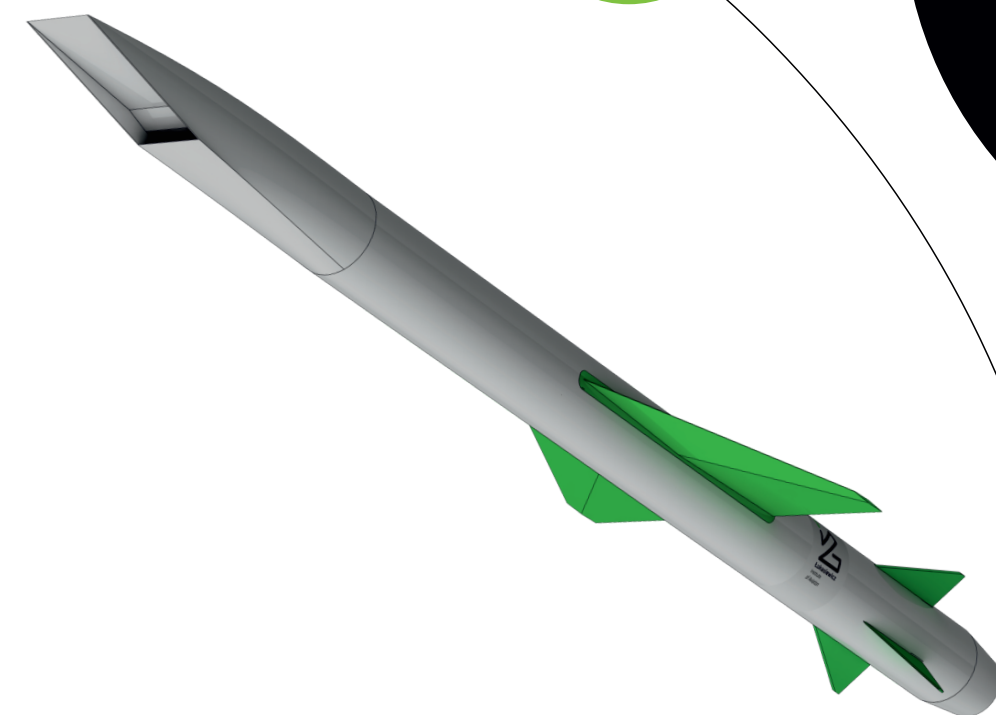




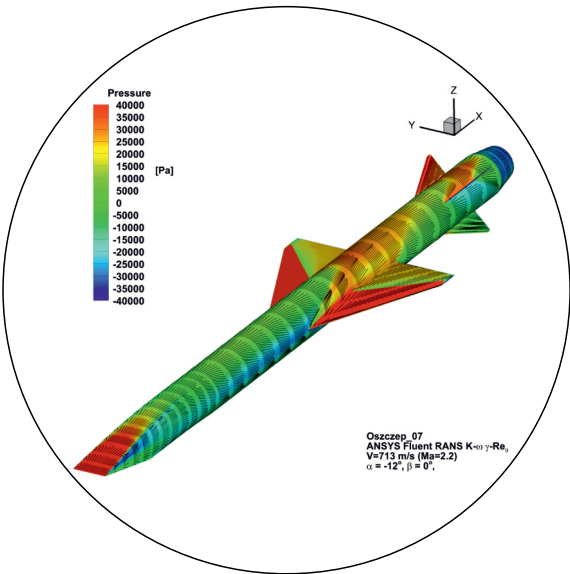
Łukasiewicz
Institute
of Aviation



MISSILE DEMONSTRATOR TECHNOLOGY WITH ROTATING DETONATION ENGINE [RDE]

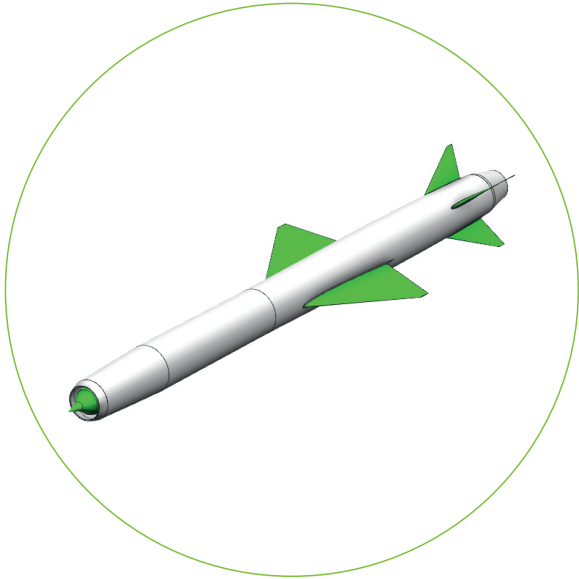
CHARACTERISTICS

Łukasiewicz Research Network – Institute of Aviation is developing a ramjet missile concept based on Rotating Detonation Engine (RDE) technology. By leveraging the potential of detonation combustion, the solution enables the development of next-generation supersonic and hypersonic systems offering enhanced performance and extended range. The concept represents a promising direction for the development of advanced detonation-powered defense systems.



Technical Assumptions of the RDE Ramjet Missile Concept

Parameter	Value
Estimated speed	Ma 3,2 (at 12 km altitude), Ma 2,1 (sea level)
Possible range	> 300 km (at 12 km altitude)
Approximate mass	300 kg, including a 100 kg warhead
Possible dimensions	length 5 m, wingspan 1,3 m
Advancement of the technology	from TRL 3 to TRL 9



KEY FEATURES

- **Higher thermodynamic efficiency**
Generates higher thrust with lower fuel consumption, resulting in extended range or increased missile speed.
- **Enhanced combat efficiency**
A ramjet engine is smaller, lighter, and less expensive than a turbine engine, allowing the missile to carry more fuel or payload. The engine's simple design enhances reliability and reduces manufacturing costs.
- **Supersonic operation**
Enables faster delivery of the payload to the target and makes missile interception significantly more difficult for adversaries.
- **Operational flexibility**
Increased efficiency and the ability to operate across a wide range of speeds and altitudes allow for the missile suitable for various combatscenarios from precision strikes to long-range strategic attacks.



The Łukasiewicz Research Network – Institute of Aviation offers a wide range of specialized research, engineering services and products. We provide comprehensive solutions, ranging from dedicated analyzes, simulations, engineering design, through the selection, testing and certification of materials and structures, to rapid prototyping and additive manufacturing.

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