

AAE450/590 Ducted Rocket Performance Analysis and Design

Fall, 2024 TTh 1:30-2:45pm BHEE 226 Prof. Heister

There has been an enduring interest in higher speed commercial aircraft dating back to the Concorde vehicle of the 1970's. Numerous firms are pursuing ambitious concepts utilizing highspeed gas turbines, ramjet/scramjet or ducted rocket propulsion. Some of the renewed interest surrounds the potential mixing benefits of using a rotating detonation rocket engine (RDRE) in a ducted rocket configuration in place of conventional combustors used in prior works.

The class will review ducted rocket prior works and RDRE theory with the goal of developing performance and sizing tools to study RDRE-based ducted rockets for a variety of missions. For the design work, team members will be assigned various roles based on engine/airframe components and overall vehicle trajectory that serves as the main tool used to arrive at a closed design. Preliminary designs will be generated for a couple different missions in order to assess the influence of aircraft size and range on the potential payoff of the technology.



Dawn Aerospace Aurora



Venus Aerospace Stargazer

Russian
RDRE
Design

