Electric Jet Engine

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Modern high bypass turbofan jet engines pollute the air and their optimal speed and altitude is fixed because of engine physics and economy. We propose using an electric motor paired with a compressor which will allow for faster, higher, safer, and more economical flights. A 1500 watt motor was paired with a planetary gearbox which drove a K03 Audi turbo compressor. The entire setup is bolted to a wooden block, which pulls on a digital 10N force probe and draws air through a flow rate meter. In order to determine the exhaust velocity, momentum equations were used to calculate the exhaust velocity of the engine. The engine was tested and data which suggested a supersonic exhaust velocity was collected. As such, electric propulsion will be able to succeed even in high speed conditions, and, when paired to a variable intake and exhaust, will thrive in subsonic environments. This allows this team to conclude that electric propulsion can, and will, phase out petroleum fueled alternatives as battery densities increase.

Awards Won:

Raytheon Technologies Corporation: Each winning project will receive $3,000 in shares of UTC common stock.
University of Arizona: Tuition Scholarship Award
Arconic Foundation: Sustainable Design In Transportation, Third Award of $1,000
American Institute of Aeronautics &amp
Astronautics: Third Award of $1000.00