

ASCENT Project 58



Improving Policy Analysis Tools to Evaluate Higher-Altitude Aircraft Operations

MIT

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Research Approach:

- **Evaluate and assimilate** changes in scientific understanding of aviation's impacts on **climate and air quality**
- Use **atmospheric modeling** to quantify sensitivity of climate and air quality to emissions up to **65 kft**
- **Re-engineer** APMT to support changes in **spatial distribution of emissions** and aircraft **emissions characteristics**
- Provide a **single tool** which can accept **gridded fuel burn and emissions** and return **climate and air quality damages**

Objective:

- Develop the APMT tool to quantify environmental impacts of aircraft operations, consistent with **current understanding of impact mechanisms**
- Extend APMT-IC to cover a **broad range of parameters**, including **high-altitude/supersonic aviation**

Project Benefits:

- APMT that includes impacts of **higher altitude emissions** including supersonics
- **Rapid evaluation** of environmental impacts of aviation, including **divergence from currently dominant patterns and technologies**

Major Accomplishments (to date):

- Updated APMT-IC to **latest standards**
- Established **sensitivity framework** to quantify emissions with altitude change
- Developed **parametric emissions estimator** for representative supersonic aircraft
- Integrated and calibrated **new RF assessment** capability
- Developed baseline **architectural plan** for APMT

Future Work / Schedule:

- End of 2021: **scenario** impact estimates and development of **gridded env. sensitivities**
- Mid-2022: **new version** of APMT