Best Views
(from the plane)
(Our dinner though)
Vibration Experiments on a Damaged Beam

Motivation

As part of an initial investigation of structural health monitoring, dynamic measurements and analysis of a composite secondary structure subjected to impact damage. Damage may be identified by assessing dynamic characteristics including natural frequency and damping ratio.

Objectives

- A series of tests were conducted to determine:
  - Experimental objectives: new materials and frequency responses for validation.
  - Undergraduate students:
    - Conduct experiments
    - Use computers to analyze and observe data.

- Key results:
  - Backward natural frequencies and damping ratios.

Analytical Model Comparison

Preliminary Conclusions

- Change of natural frequencies: measured frequency responses versus finite element model.
- Damping ratio: between experiment and theory.
- Scale factor: between experiment and theory.

Sources of Error

- Testing errors:
  - Experiment setup
  - Signal processing

Future Work

- Next step: to the damage behavior in a continuously updated condition.