The Modelica based Flight Dynamics library enables the rapid modeling, simulation and analysis of the flight dynamic characteristics of a wide range of flight vehicles. The library is ideal for the multi-disciplinary development of accurate flight control laws as well as for use in real-time flight simulators for commercial and military aircraft, unmanned aerial vehicles (UAVs), airships and rotorcraft.
TYPICAL USE CASES

- **Aircraft Design**
  Assess the impact of aircraft design configuration changes on flight characteristics early in the design process.

- **Flight Control Law Design**
  Design and analyze multi-disciplinary flight dynamic control laws for flight and system dynamics.

- **Mission Simulation and Optimization**
  Rapidly execute mission simulations to assess flight performance or to optimize flight trajectories to minimize fuel burn, emissions and flight time.

- **Real-Time Simulation**
  Leverage accurate flight dynamic models and realistic visualization to create real-time simulators for training pilots and product marketing.

KEY FEATURES

- **Full Compatibility with Standard Libraries**
  Develop and interconnect airframe and systems models using standard mechanical connectors.

- **Scalable Complexity**
  Quickly switch between point mass or full six-degrees-of-freedom equations of motion, local geodetic or WGS’84 position states, velocity states in body or flight path coordinates via a single parameter.

- **Detailed Environment Models**
  Simulate one or more aircraft in a single model using a common detailed gravity, magnetic field, terrain, wind and atmospheric models.

- **Accurate Trimming**
  Accurately initialize flight dynamic models to their desired initial state.

LIBRARY CONTENTS

**Flight Vehicle Components**

- Aerodynamics and Propulsion base classes
- Airframes and Kinematic components
- Weight and Balance components
- Sensor and Control systems

**Environment Models**

- Earth and Terrain models
- Atmosphere and Wind models
- Ground Objects

**Interfaces**

- Flight Gear visualization
- External Devices input

BENEFITS

- True multi-disciplinary modeling and simulation of aircraft flight dynamics
- Supports simulation from on-ground operations through to high speed and high altitude flights
- Model complexity can be easily scaled to enable analysis and simulation at any stage of the design process
- Improved model maintenance through the use of a single tool for modeling, control and simulation
- Ability to integrate with a wide range of other compatible Modelica libraries

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