ADAVES

ADvanced AVionics Equipment Simulation

EDISOFT
DEFENCE & AEROSPACE TECHNOLOGIES

FACULDADE DE CIÊNCIAS
UNIVERSIDADE DE LISBOA

LABORATÓRIO DE ÓPTICA, LASERS & SISTEMAS

AleniaAermacchi
A Finmeccanica Company

CLEANSKY

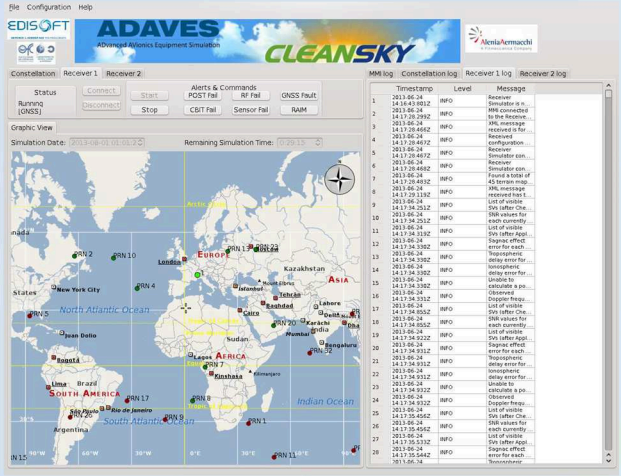
ADAVES provides an end-to-end realistic simulation infrastructure that makes possible having different simulation scenarios with multiple aircrafts (different GPS Receivers) all within the same consistent GNSS environment, while allowing for different local effects in each Receiver.

The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) for the CleanSky Joint Technology Initiative under grant agreement n° 271881.

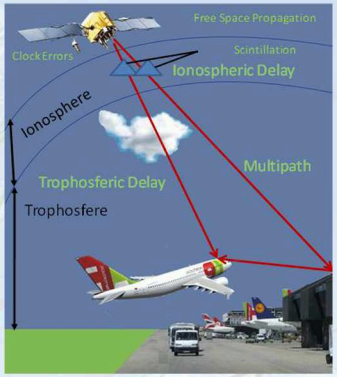
ADAVES

ADvanced AVionics Equipment Simulation

The objective of the ADAVES project is to develop a high fidelity and accuracy GPS system simulation, capable of being seemly integrated in Green Regional Aircraft (GRA) flight simulator (for CSJU). ADAVES project main goal is to support the green FMS system development, through the development of a GNSS receiver simulator and related GNSS constellation simulator.
Both simulators will enable to infer how the available GNSS (even considering the set of error introduced by the different local effects and associated mitigations) will be an added value in the green FMS goal.



*"**ADAVES** provides an end-to-end realistic simulation infrastructure that makes possible having different simulation scenarios with multiple aircrafts (different GPS Receivers) all within the same consistent GNSS environment, while allowing for different local effects in each Receiver."*



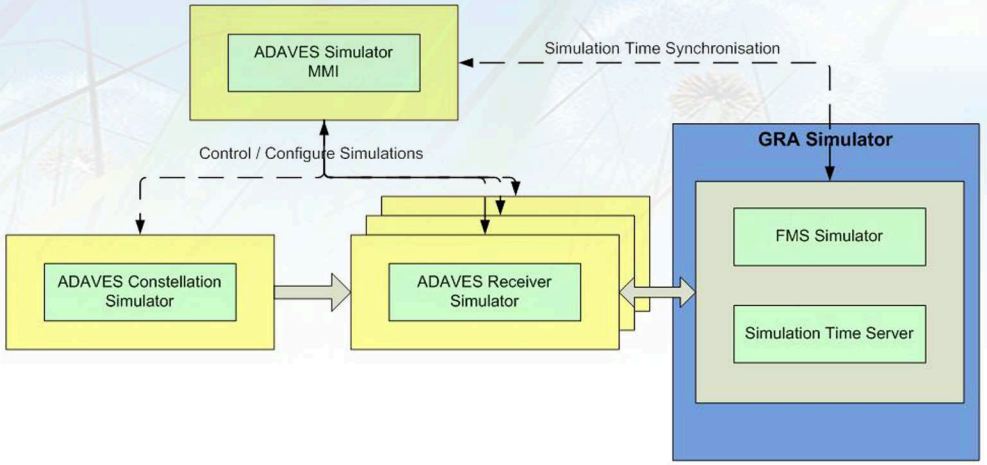
ADAVES is an avionics equipment simulator constituted by three major modules: the Constellation, Receiver and Man Machine Interface (MMI).

The Constellation Simulator is responsible for simulating the GPS constellation accurately. It will produce navigation messages for each satellite in the constellation and broadcast them to the running Receiver Simulators. The messages' contents and timings will replicate the ones from the real GPS constellation.

The **GNSS Mode** allows for a realistic simulation of real conditions by adding constraints and sources of errors, such as: signal obstruction due to terrain geography, scintillation effects, free space propagation, relativistic, satellite clock, Doppler shift, troposphere and ionosphere delay and multipath effect.

Additionally, the system also provides a **MMI** for configuring different options, such as the simulation epoch and duration, injection of errors, and also to allow the user to have a graphical representation of the simulation.

The Receiver Simulator will receive the messages sent by the Constellation and compute its navigation solution, containing: GPS time, position, velocities, track angle, integrity limit, figure of merit, dilution of precision, RAIM and PRAIM information. It will be possible to operate the Receiver Simulator under 3 different modes: Single Position, White Noise and GNSS.



The **Single Position Mode** is a readback of the received data from GRA.
The **White Noise Mode** introduces errors in the position and velocity vectors using a Gaussian distribution with given standard deviation.