Modelling of stringers of an airplane wing using finite elements (type shell). Analytical calculation of the elastic properties of the composite with micromodelling. Fiber orientation produces orthotropic material properties. Boundary conditions according real mechanical test.

The experimental work performs two activities: firstly, a non-destructive inspection with ultrasounds to identify defects and manufacturing damages; secondly, a mechanical destructive three-points bending test.

Non-destructive test NDT performs a phase-array 3D scan of the stringer.

Manufacturing of a multilayer of glass fibers and epoxy resin. Vacuum infusion process.

Layering and moulding for manufacturing a stringer with pre-pregs. Longitudinal reinforcement.

Use Mic-Mac software to calculate the structural performance of a stringer of an aircraft component part with composite laminates. Evaluate the stacking sequence, ply properties and failure criteria.