FLEX

Flutter expert system for general aviation composite structures.

The Institute of Aviation (IoA)

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The small aircraft design challenges

- increasing efficiency of propulsion systems
- utilization of advanced composite materials
- increase the small aircraft speed limits
- flutter design drivers should be considered on early design stage
- the FEM CSM models of composite structures are effective for transport aircrafts

The “Flutter Expert System” is needed to accelerate development of small aircraft structures using the enhanced design tool. The newly elaborated system should allowed a nearly real time dimensioning of the composite structure.
Research in Poland on the simplifications of small aircraft flutter clearance using affordable, in house software has been started in 1975. The Institute of Aviation has now main research institution which delivers the industrial partners flutter calculation results for EASA in Poland.
The “Flutter Expert System” will consist of:

1. Control unit including:
   - aircraft configuration data
   - simplified structural beam model data including factors for non-structural mass
     (partially under preparation in CESAR project)
   - mass evaluation
   - structural composite layout data
   - flutter analysis method data

2. Beam stiffness interface

3. Mass distribution evaluator

4. Free vibration interface

5. Eigen modes – flutter interface (interface elaborated during TAURUS project)

Thank for your attention