ANSA AND EPILYSIS AS A LINEAR ELASTIC FRACTURE MECHANICS (LEFM) TOOL FOR 2D STRUCTURES

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KEYWORDS –
LEFM, 2D structures, Crack Propagation

ABSTRACT –
Crack propagation is one of the most critical aspects that must be taken into account to determine Flight Inspections Intervals of an airplane.
Test campaigns and simplified models (based on mathematical solutions and boundary elements) represent the standard tools for this discipline.
The FEM approach could be very helpful to build more realistic models and to accurately evaluate the Stress Intensity Factor at the crack tip.

The aim of this tool is to start integrating

- The Automatic FEM model mesh generation in order to evaluate stress
- The Linear Elastic Fracture Mechanics equations implementation (through a VCCT approach) to evaluate Stress Intensity Factor at the tip(s) of the crack(s)
- The capability to deal with long and complex load histories for crack propagation calculation

in order to extract for 2D structures

- Stress Intensity Factor curves as a function of the crack length
- Crack Length curves as a function of the number of cycles