

[Type here]

MSC graduation Assignment: Effect of defects in composite flexure meant for morphing application

GKN Fokker is working on the development of morphing wing parts, with as concept the combination of a continuous flexible skin and a structural element meant on the one hand to prevent transverse deformation of the skin due to aerodynamical load, and on the other hand not to resist the morphing of the wing. A sketch of the morphing wing is shown in next figure, with the so-called 'Flexible Shear Element'.

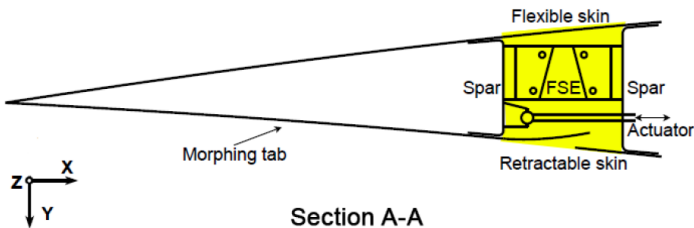


Figure 1: Sketch of the GKN-Fokker morphing wing concept.

The Production Technology group at the University of Twente has worked recently on a methodology meant to propose a design for the concept of the FSE. The study has led to the production of the FSE made of woven fibre reinforced thermoplastic as shown in Figure 2. This solution is based on a T-joint assembly system and has been validated on a 2m long winglet.

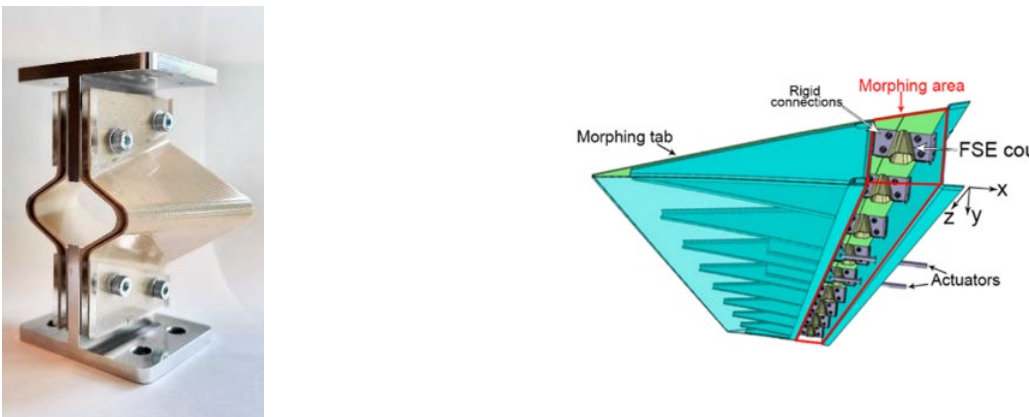


Figure 2: UTwente FSE design and application on a 2m long demonstrator

One of the next step to be defined towards an industrial application is the characterization of the effect of production induced defects on the (long term) performance of the flexure.

The proposed project therefore proposes to identify, characterize and evaluate the effect of production defects on relevant mechanical properties of the flexure.

The project is to be performed at the UT, in collaboration with GKN Fokker.

Supervision: Laurent Warnet (PT), Hans van Goozen (GKN Fokker)