

# Working at the top of technology

NLR is the Netherlands Aerospace Centre for identifying, developing and applying advanced technological knowledge in the area of aerospace. Our activities are relevant to society and market-oriented. We thus strengthen the innovativeness, competitiveness and effectiveness of government and business.

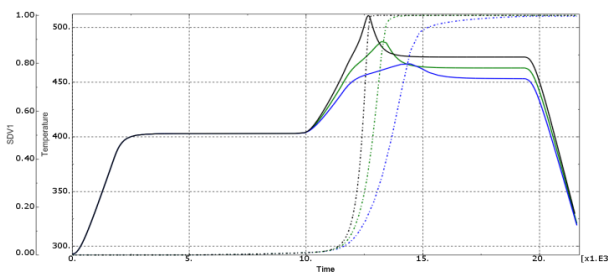
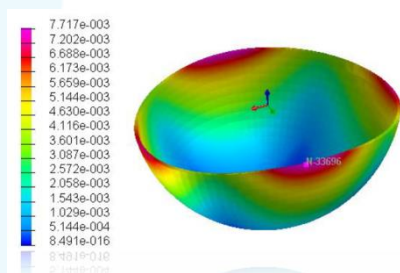
## Assignment: Manufacturing process simulation and validation of composite curing process

### Description

NLR has experience in design, optimization, manufacturing and testing of composite structures and are working on the latest composite manufacturing technologies. Vacuum infusion processes and Resin Transfer Moulding (RTM) processes in combination with Automated Fiber Placement (AFP) or Pick & Place are used to manufacture large aerospace components like wing and fuselage parts. High-spec parts require high geometrical accuracy. When the part is released from the mould it often shows distortion due to thermal effects during the curing cycle.

The aim of this research assignment is further developing and evaluating the manufacturing curing process simulation using computational mechanics tools and increase understanding. The in-house developed curing simulation tools within Abaqus and software from ESI can be used for the prediction of cure stresses and distortions of composite parts. Validation of the numerical predictions will be done with coupon-sized parts or available measurement data.

We are looking for a motivated student with a background in composite mechanics and preferably experience in Finite Element modelling (Abaqus) and scripting (python).



### Contents of the assignment

- Literature study
- Parameter study with current tools / software
- Manufacturing of coupon-size parts
- Verification, calibration and validation of tools / software
- Evaluation of the results
- Reporting

Dedicated to innovation in aerospace

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## Duration and place

Duration is 5-9 months

Location is:

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