

# TOWARDS A PARAMETRISED NON LINEAR AND TRANSIENT MODEL OF THE AUTOMATED FIBRE PLACEMENT

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Due to its ability in producing pieces of complex geometry whilst avoiding polymerisation in an autoclave, the Automated Fibre Placement (AFP) is a promising solution to face the increasing needs of composite materials. In order to optimize this process we want to model it in an efficient way, by using the so called Proper Generalised Decomposition method.

The aim of such a model is to get a kind of abacus so that it will be easy to control, in real time, the power of the heat source, given the parameters of the process (see [1]).

Up to now, the AFP process has been studied in the stationary case, in the frame related to the moving lasser, allowing the calculation of the transient solution at each point of the part as soon as the line velocity is constant (see [2]).

In our study we propose to solve the transient heat equation related to a thermal source moving with non uniform velocity. The velocity will be parametrized and the coefficients involved in it included as model extra-coordinates, allowing the calculation of a general parametric solution.

We are also interested in taking into account the thermo-kinetic of the curing that leads to strong non linearities.

## REFERENCES

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