

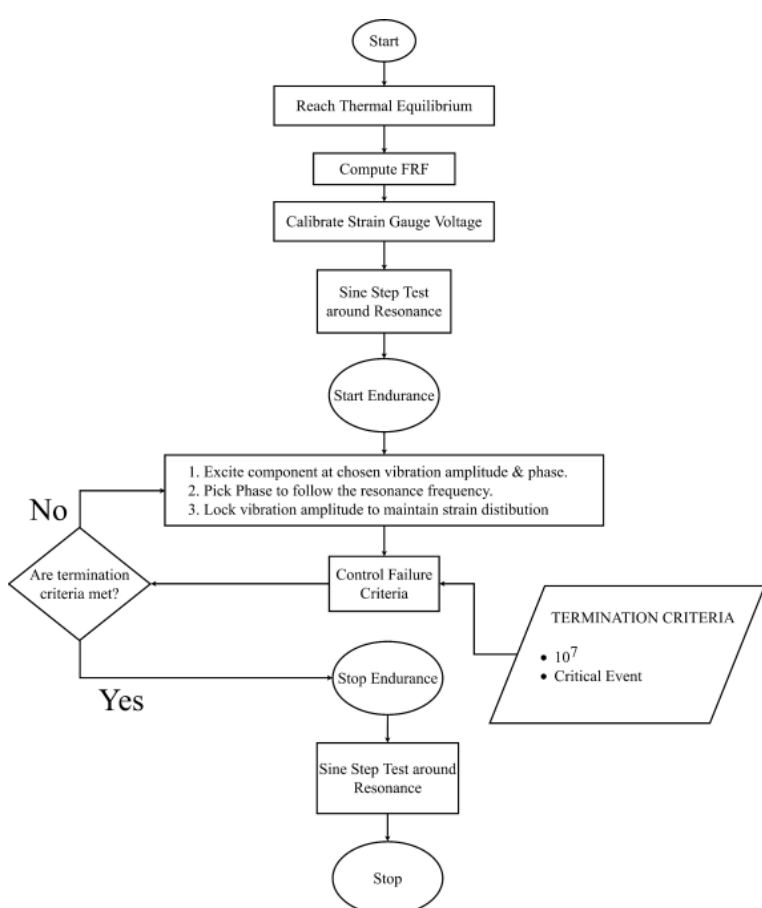
## Durability Modelling of Composite Structures with arbitrary lay-up using standardised testing and artificial intelligence

Di Maio, Lasen, Schönthaler, Rashed

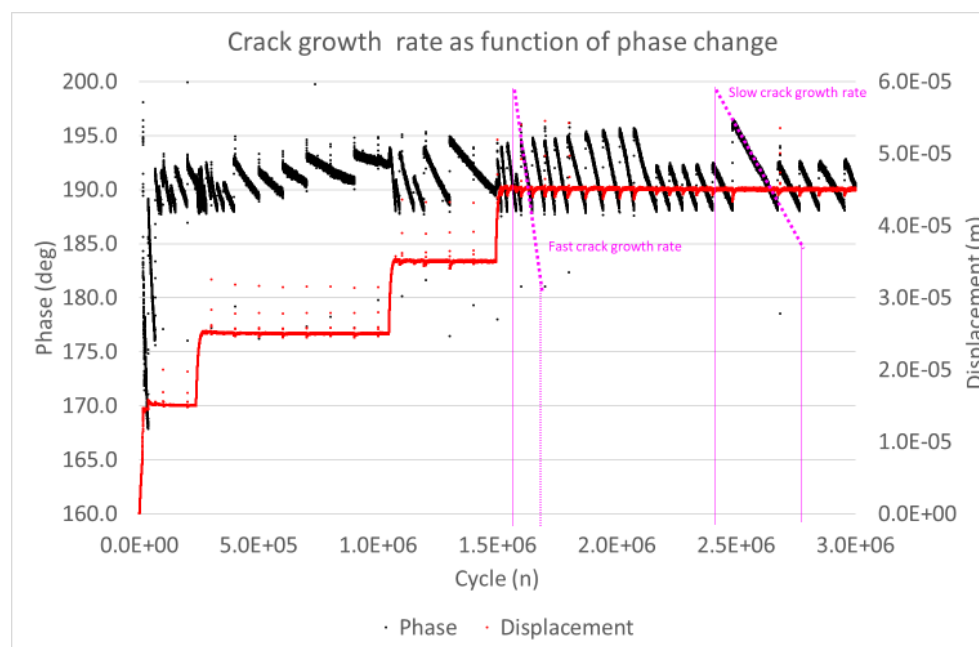
### Fatigue damage growth using modal-based dynamic testing

Fatigue damage growth is carried out by **modal-based dynamic testing**. A composite structure is vibrated at constant strain and constant excitation frequency near one of the fundamental modes of vibration. The **phase of the transfer function** (the ratio between the response and the stimulus) is monitored over the number of excitation cycles to detect the onset of delamination and the damage growth rate. The phase tracking is very sensitive to damage detection, from micrometres to a few millimetres' length. **MONTEVERDI** is a fully automated software controlling the measurement chain. Experimental data and material properties will be the inputs of a **Numerical Framework** of analysis used for calculating the fatigue behaviour of structures under operational dynamic loads.

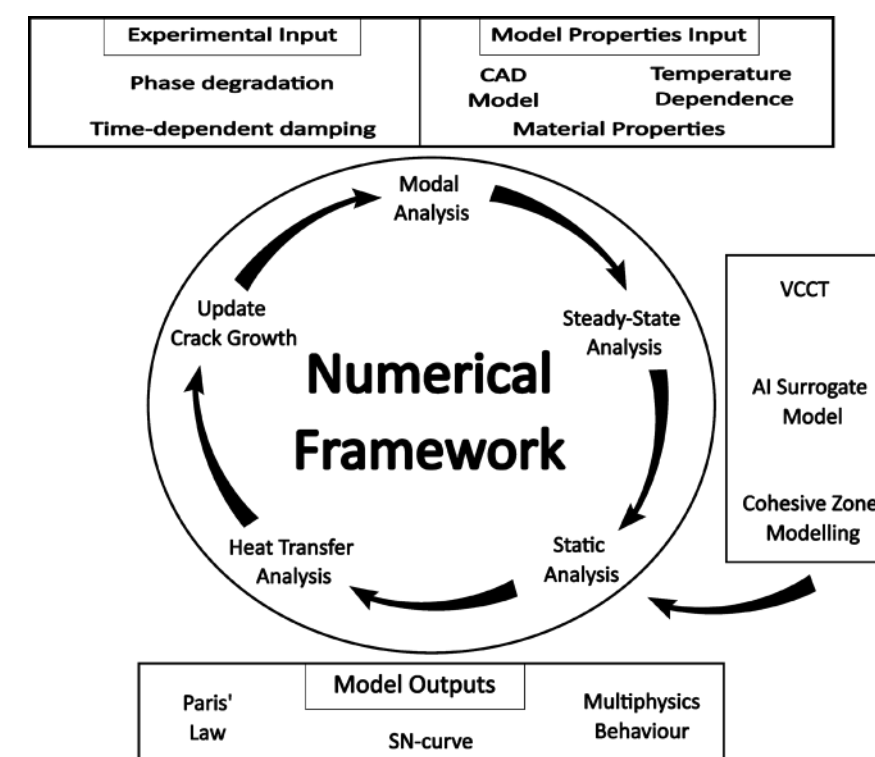
#### MONTEVERDI



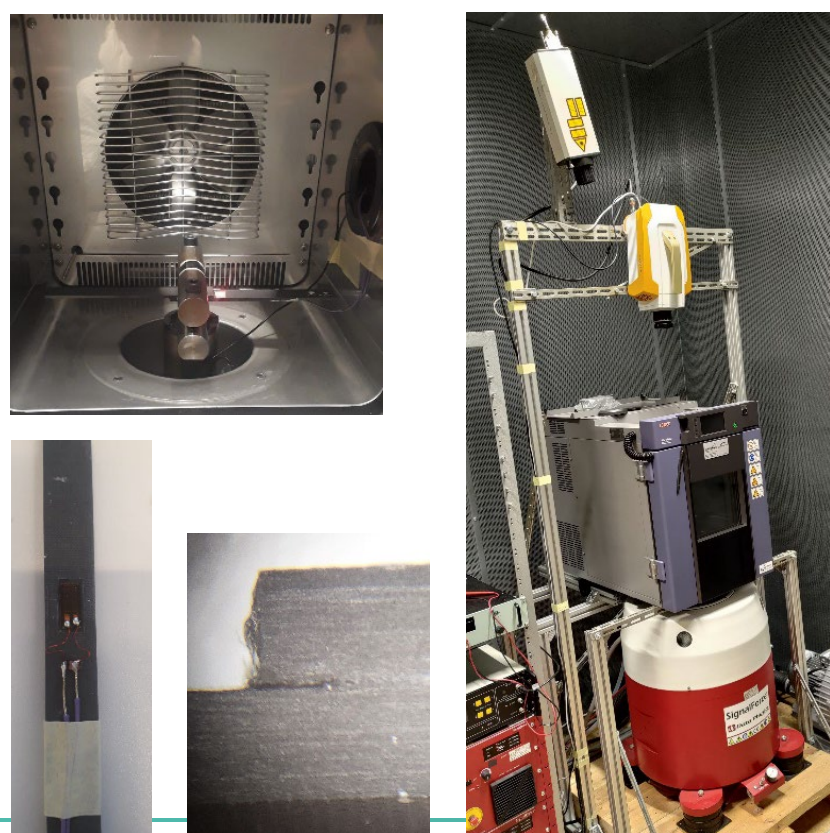
#### Fatigue damage growth for a Zoltec sample



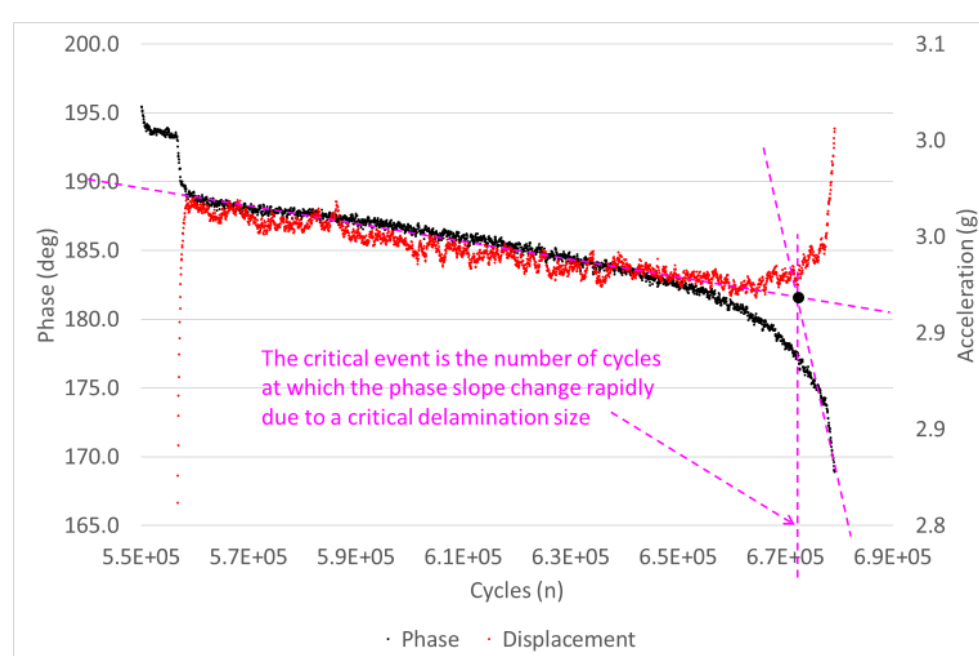
#### Numerical Framework



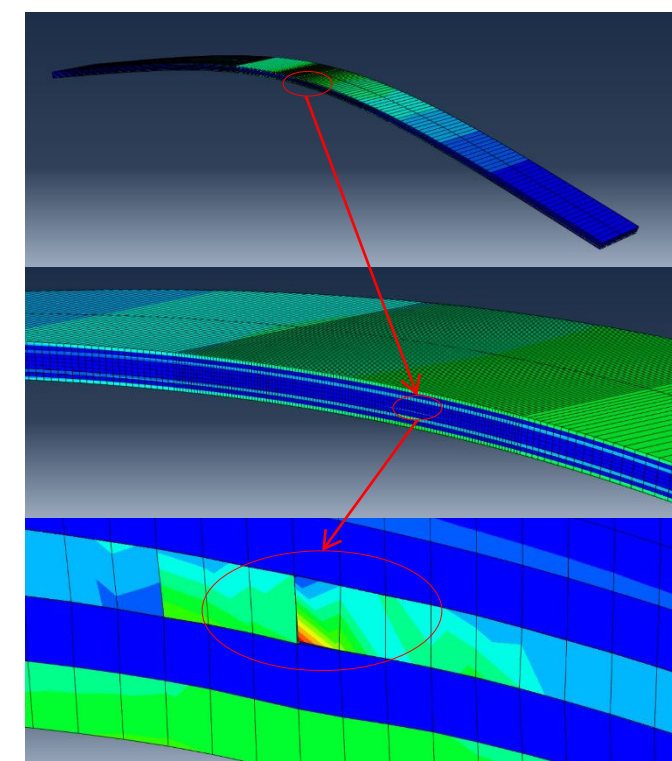
#### Sample with Strain Gauge and test setup



#### Fatigue damage growth and critical event for an IM7 sample



#### FE model with delamination



#### CONSORTIUM



UNIVERSITY OF TWENTE



#### DISCOVER MORE

Email: [contact@d-standart.eu](mailto:contact@d-standart.eu)

Coordinator: Marco Narwijn, NLR



d-standart.eu



LinkedIn