Department of Aerospace Engineering Yamamoto Laboratory

http://www.plum.mech.tohoku.ac.jp/yamamoto_lab/

Carbon Fiber Reinforced Plastic (CFRP)

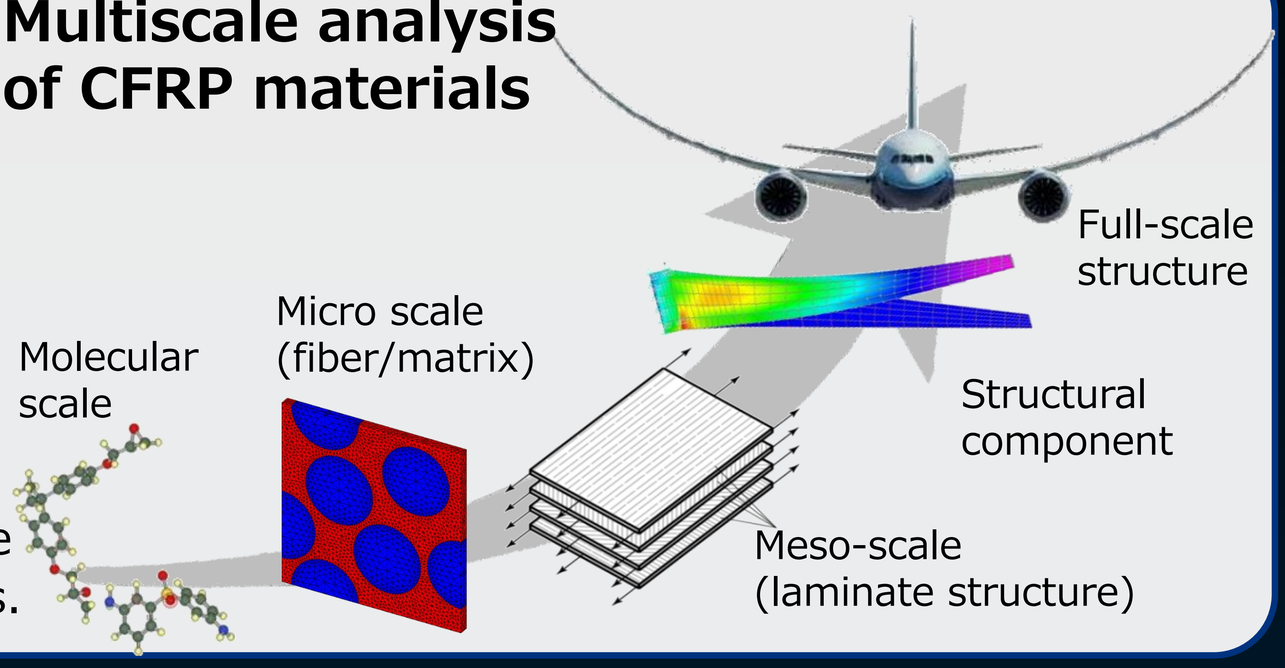
Carbon fiber

Polymer matrix

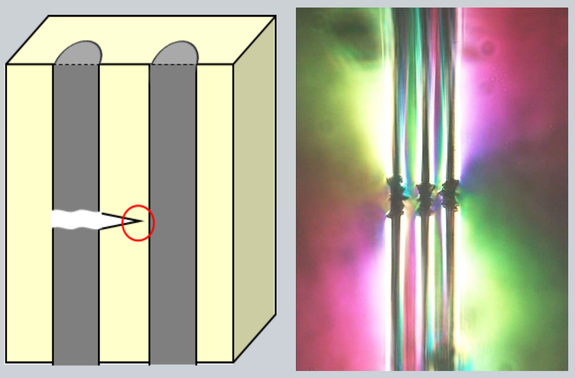
CFRP materials

The Yamamoto group aim to understand the structure-properties relationship in advanced composite materials based on nanomechanics and micromechanics.

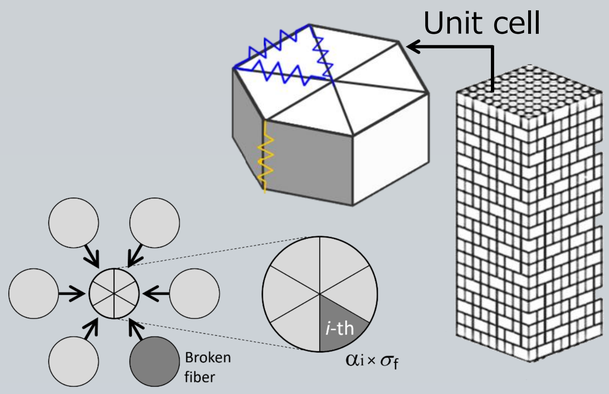
Multiscale analysis of CFRP materials



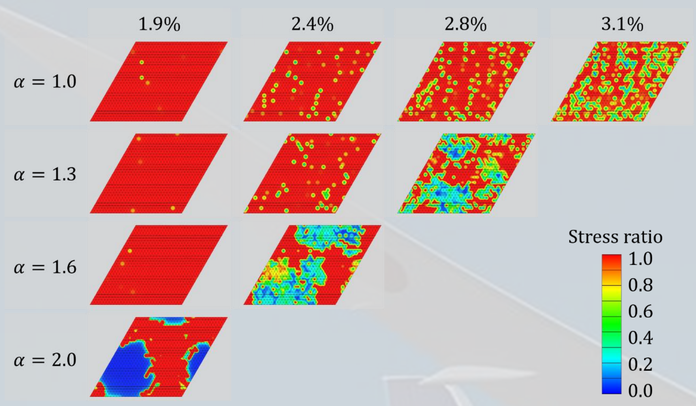
Considering the Stress Concentration of Fiber Surfaces in the Prediction of the Tensile Strength of Unidirectional CFRP Composites

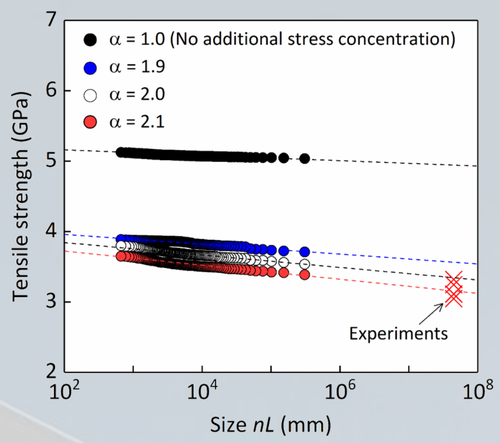


Additional stress concentration on the fiber surface adjacent to a broken fiber



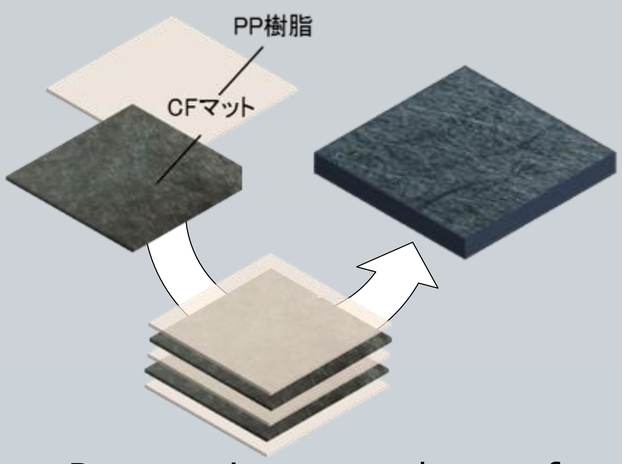
Definition of the stress concentration on the surface of the *i*-th fiber segment.



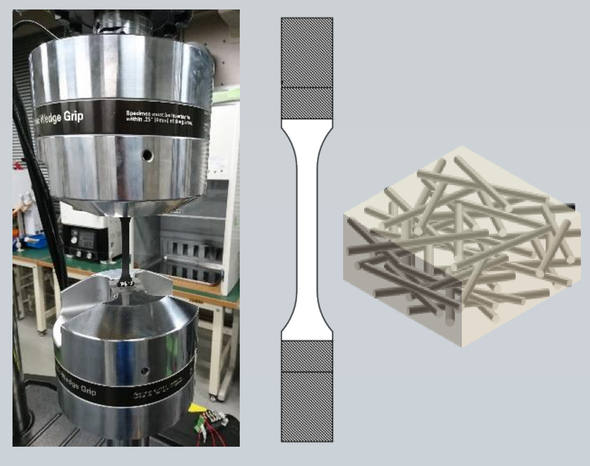


Prediction method yields a reasonably accurate tensile strength prediction when surface stress concentration on intact fibers is appropriately considered

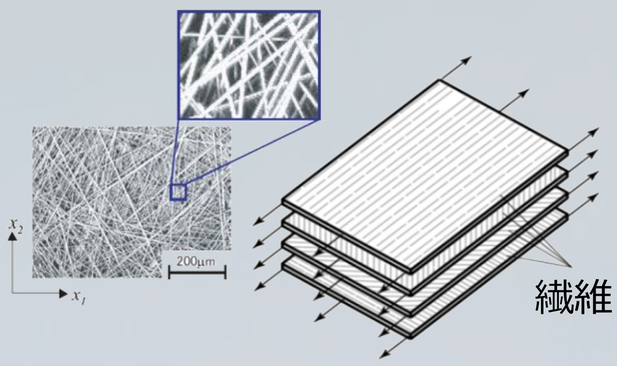
Microstructure-based Prediction of Fatigue Properties of Short Fiber-Reinforced Thermoplastics (SFRTP)



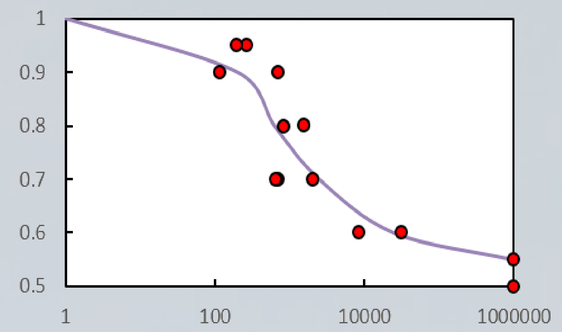
Preparation procedures of the discontinuous CFRP composite



Evaluation of tension-tension fatigue behavior with dumbbell-shaped specimen

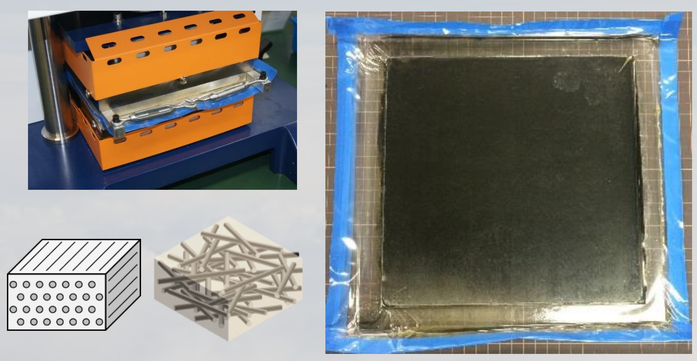


Fatigue property analysis by micromechanics method

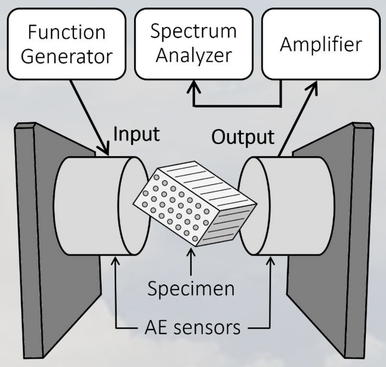


Comparison of the experimental and simulated results

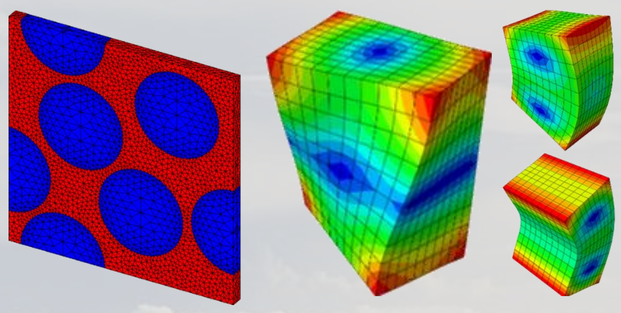
Determination of Full Elastic Constants of Carbon Fiber in Carbon Fiber Reinforced Plastic Composites - Resonant Ultrasound Spectroscopy (RUS) Study -



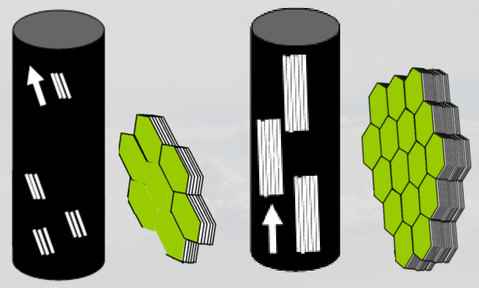
Hot-pressing machine and prepared UD-CFRP composite



Schematic drawing of the experimental setup for resonance frequency measurements



Unit-cell model for PUC analysis and vibration modes of the UD composite



PAN-based carbon fibres that are thought to represent a wide range of different nanostructures