

# 10th GACM

Colloquium on Computational Mechanics  
for Young Scientists from Academia and Industry  
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## Modeling of fiber-based products

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Textiles are fiber-based structures. The modern textile reinforcement composites are based on fiber-based structures, too. The modeling of these structures was based early mainly on geometrical methods or using simple models based on the analytical mechanics. During the last time significant results are achieved using the computational mechanics. The most problems during modeling are in the combination of the following typical parameters of the structures:

- they are based on a huge number of single fibers (at least 40 fibers per cross section in a single yarn, couple hundred yarn pieces per small sample)
- fibers and their parameters are not regular
- friction (with the stick and slip effect) plays significant role for the behaviour
- the problems are usually non-linear (non-linear geometry, non-linear relations in the equilibrium equations) and the systems of equations are usually stiff.
- properties of the structures depend on the load case (under tension, lateral compression, torsion, bending).

The aim of the symposium will be to connect young and experienced researchers, using computational mechanics to model the fiber-based structures and final products and the problems of their engineering design. Further, the aim is to demonstrate the open problems to the peoples of the computational mechanics and to allow broad discussions and possibilities for new cooperation between research teams.

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