3D simulation of floral oil storage in the scopa of South American insects[1] ALEXANDER RUETTGERS, MICHAEL GRIEBEL, Institute for Numerical Simulation, University of Bonn, LARS PASTRIK, HEIKO SCHMIED, DIETER WITTMANN, Institute of Crop Science and Resource Conservation, University of Bonn, ANDREAS SCHERRIEBLE, ALBRECHT DINKELMANN, THOMAS STEGMAIER, Institute of Textile Technology and Process Engineering, Denkendorf, INSTITUTE FOR NUMERICAL SIMULATION TEAM, INSTITUTE OF CROP SCIENCE AND RESOURCE CONSERVATION TEAM, INSTITUTE OF TEXTILE TECHNOLOGY AND PROCESS ENGINEERING TEAM — Several species of bees in South America possess structures to store and transport floral oils. By using closely spaced hairs at their back legs, the so called scopa, these bees can absorb and release oil droplets without loss. The high efficiency of this process is a matter of ongoing research. Basing on recent x-ray microtomography scans from the scopa of these bees at the Institute of Textile Technology and Process Engineering Denkendorf, we build a three-dimensional computer model. Using NaSt3DGPF, a two-phase flow solver developed at the Institute for Numerical Simulation of the University of Bonn, we perform massively parallel flow simulations with the complex micro-CT data. In this talk, we discuss the results of our simulations and the transfer of the x-ray measurement into a computer model.

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