PRESS RELEASE

Anuga FoodTec: Process Simulation with MESHFREE

Innovative Simulation for the Food Industry

Whether cleaning, stirring, kneading or injection processes – MESHFREE can be used to reliably simulate food technology processes. The software product developed by the Fraunhofer Institutes for Industrial Mathematics ITWM and for Algorithms and Scientific Computing SCAI uses grid-free simulations to map physical processes. This year, the institutes will again be represented at Anuga FoodTec from April 26 to 29 in Hall 7.1 at Stand A049.

The requirements in the food industry are diverse: from coatings to extrusion, forming, homogenization, and pressing processes – thanks to MESHFREE, material behavior in these applications can be simulated without any problems. One example is the filling of a beer glass, where foam formation presents a particular challenge for the simulation.

Here, MESHFREE combines the many years of expertise of the Fraunhofer Institutes ITWM and SCAI in simulating complex physical processes: The software product is based on a general material model, which can also be used to represent complex material behavior and can be handled with the numerical methodology.

Successful Cooperation

The two mathematical institutes work hand in hand: MESHFREE originated as a synthesis of two successful software packages and has been continuously developed since then. Fraunhofer SCAI is responsible for the highly efficient solution of the large systems of equations to be solved during the simulation and for performance optimization; Fraunhofer ITWM is in charge of the underlying numerical methodology for the precise simulation of the physical processes.

Currently, the ITWM focuses on the simulation of cleaning processes in the food industry. In the project »SpraySim«, which is funded by the German Federal Ministry for Economic Affairs and Climate Action, the researchers simulate cleaning liquid that reaches the surfaces via nozzles as a disintegrated spray jet.

Researchers from both Fraunhofer Institutes will be at the booth during the trade show days and will be available for questions and discussions.

Visuals

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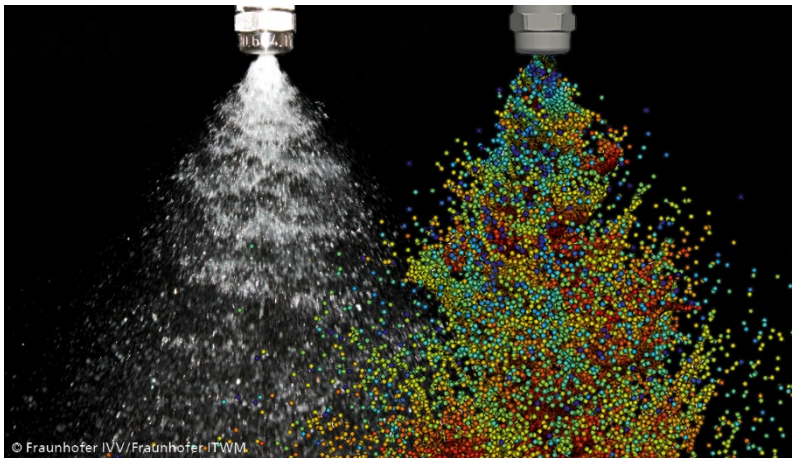
A spraying full-cone nozzle: left in the experiment, right in the simulation.

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About the Fraunhofer Institute for Industrial Mathematics ITWM

The Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern is one of the largest research institutes for industrial mathematics worldwide. We see our task in further developing mathematics as a key technology and providing innovative impetus. Our focus is on the implementation of mathematical methods and technology in application projects and their further development in research projects. The close cooperation with partners from industry guarantees the high practical relevance of our work.

Their integral components are consulting, implementation and support in the application of high-performance computer technology and the provision of tailor-made software solutions. Our various competencies address a wide range of customers: automotive industry, mechanical engineering, textile industry, energy and finance. This also benefits from our good networking, for example in the High performance center "Simulation- and software-based innovation".

About the Fraunhofer Institute for Algorithms and Scientific Computing SCAI

The Fraunhofer Institute for Algorithms and Scientific Computing SCAI combines know-how in mathematical and computational methods with a focus on the development of innovative algorithms and their take-up in industrial practice – bringing benefits to customers and partners. To this end, the institute models and optimizes industrial applications and develops software and services for product design, process development, and production.

The institute offers its customers comprehensive software solutions and services for optimizing industrial packaging and cutting problems, for the virtual design of new materials, for the analysis and optimization of energy networks, and for multiphysics applications. In machine learning, SCAI develops new intelligent methods and adapts data analysis methods to concrete use cases. The goals are shorter development times, more cost-effective experiments, and optimized workflows.