Autor(en) des Beitrags:
Knezevic, J.; Mundani, R.-P.; Hernandez, H.; Fogal, T.; Jevremovic, T.; Rank, E.

Titel des Beitrags:
Interactive Computing in Numerical Modelling of Particle Transport Methods

Abstract:
Nowadays, with the ever-increasing limit of CPU power, even high accuracy simulations of computationally extremely complex problems are made possible. Although the potential advantages of being able both to simultaneously preview intermediate results, and steer the simulation parameters in real-time, are obvious to all engineering numerical communities, this demand stays often unsatisfied within actual numerical experiments. A generic, simple, elegant and robust pattern enabling this feature can significantly contribute to widening the scope and the number of interactively steerable applications. In this paper, we describe the extension of our computational steering framework, which proves itself, one more time, to be applicable to the diversity of engineering scenarios due to its extreme flexibility and convenience for integration. Namely, with only minor code changes necessary, it makes the simulation course interruptible at any point during the program runtime. This is crucial for keeping the relation between the user interaction and its immediate effect transparent, thus, for the intuitive and comfortable optimization and exploration themselves. Furthermore, it supports visualization on the fly, exploiting its possibilities to the full extent, even in the case of very intensive updates from the user side and/or time- and memory-consuming simulations. In this context we present the new integration of the framework into the computationally efficient, high accuracy, geometry independent neutron transport simulation environment, which is supposed to enable researchers' and educators' interplay with virtual models of nuclear reactors or their parts, both in 2D and 3D, hence, simultaneous computation and visualization of the scalar fluxes.

Kongress- / Buchtitel: