Simulation of Biosensors
Using Distributed Computations
Based on the VIOLA Network

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Abstract: We present first results of numerical simulations of a 3-d biosensor based on the surface acoustic wave principle. The computations have been conducted making use of local simulations at different PC-clusters via the ultra fast electronic network VIOLA (Vertically Integrated Optical Testbed for Large Applications). The idea of decomposition is implemented with the FE program FELICS, originally developed at TUM and adopted to domain decomposition techniques by the Modelling group at caesar. FELICS was ported to the VIOLA net, which provides a lot of services:

- UNICORE (Uniform Interface to Computing Resources) that offers Meta-Schedulers for computer and net resources

- Meta-MPI library for data transfer between VIOLA clusters

- Tools for processing of FE data and debugging of parallel applications

In the future we expect to be able to simulate the SAW sensor with up to 10^7 degrees of freedom.

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