**SCope** – Time Decoupled Parallel SystemC Simulation

Jan Henrik Weinstock, Christoph Schumacher, Rainer Leupers, Gerd Ascheid and Laura Tosoratto

**SCope** is a parallel SystemC kernel, compliant with IEEE 1666-2011

- **SystemC Models**: SCope has been tested to work with Synopsys Processor Designer Models, SCML- and TLM-based models
- **SCope’s TLM software layer** abstracts cross thread communication
- **SCope’s SystemC kernel** allows `SC_THREADS` and `SC_METHODS` to run in parallel

**SCope** uses multiple threads for simulation, each with its own state – such as time

- Each simulation thread receives its own state (e.g. time) and executes its own simulation loop
- Thread simulation times must not deviate from each other by more than the lookahead $t_{la}$: $\forall t_i \neq t_j, t_j > t_i + t_{la}$
- **SCope** avoids causality errors and operates deterministically

**SCope** achieves linear speedups simulating the EURETILE system

- Tests show linear speedup running a system with 64 RISCs (System runs a distributed FFT and a network stress-test app)
- Speedup > 3.8 until lookahead drops below CPU cycle time