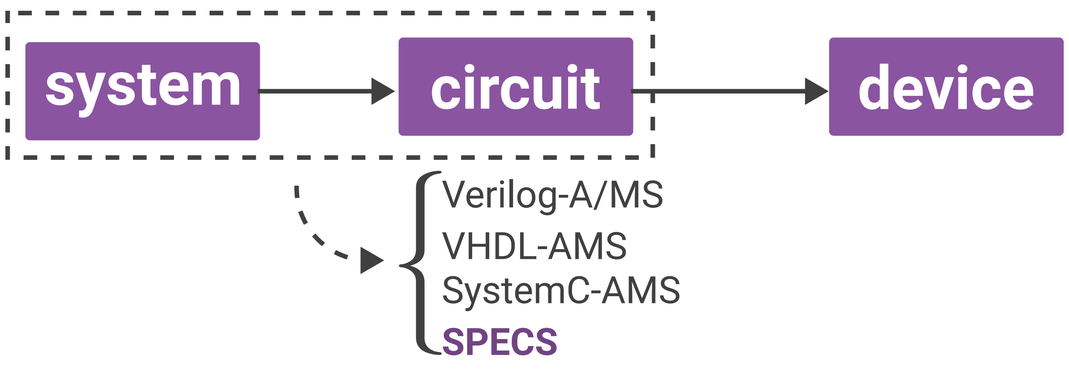
With **SPECS**, we accelerate simulation of photonic systems for **system designers**

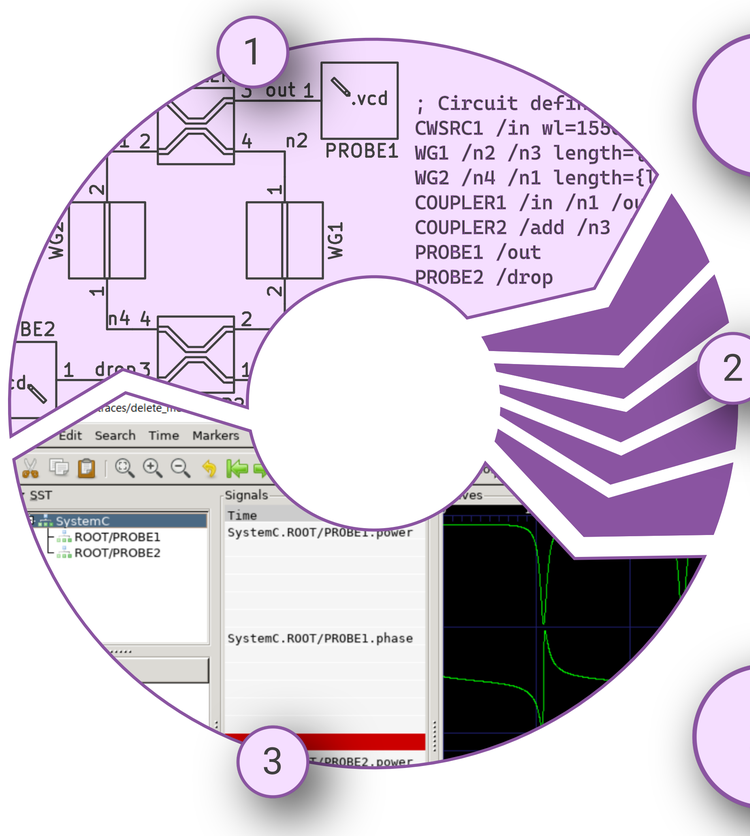
try it out !

Context

From communications to computing, building large-scale systems calls for efficient modeling tools beyond the device-level. We developped **SPECS** (Scalable Photonics Event-driven Circuit Simulator) as an effort to accelerate simulation of photonic circuits.

Telecom Sensing Computing





1 Define

Define your circuit in a schematic editor, or directly as a netlist

2 Simulate

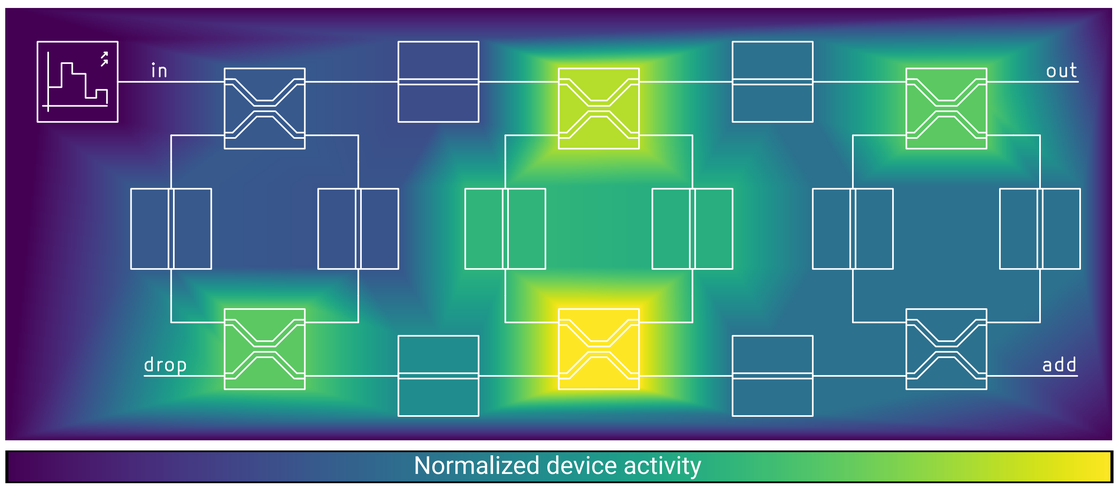
Run SPECS to simulate the photonic circuit and obtain output trace files

3 Analyze

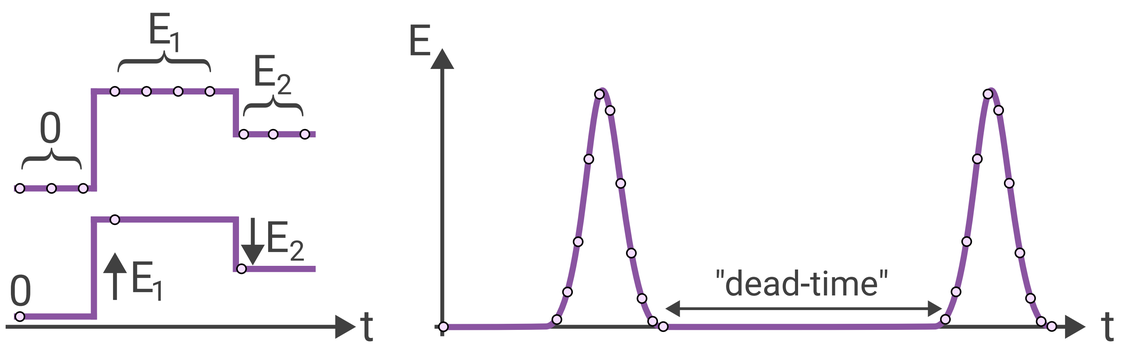
Results can be viewed in GTKWave or exported to Pandas DataFrames

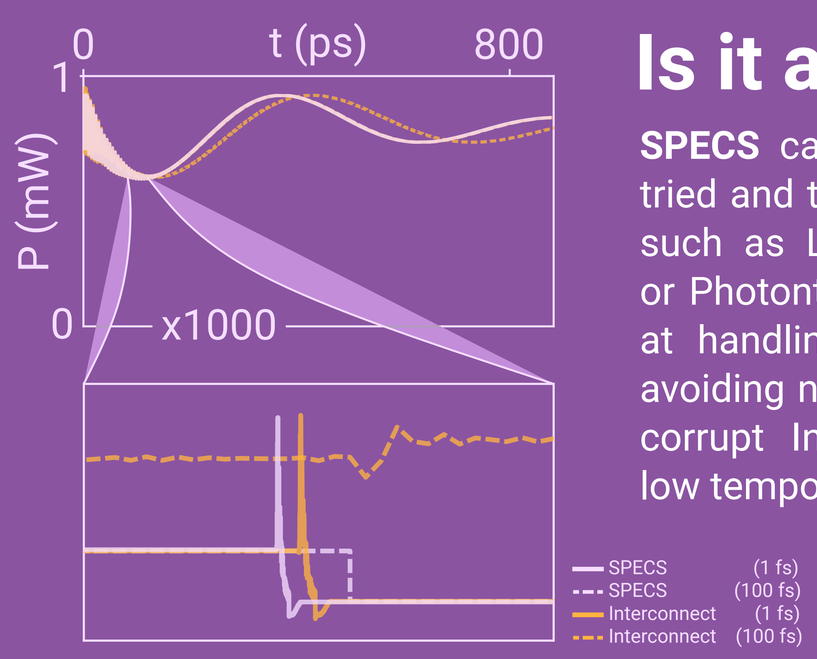
Event-driven photonics

Usable as a SPICE-like standalone program or as a SystemC library, **SPECS** simulates devices only when needed, saving computer resources and designer time.



In event-driven simulation, signals are not sampled regularly: only variations of the electric field propagate. This scheme is particularly well suited to photonic circuits due to the timescale difference between signals (~ns) and propagation delays (~ps).



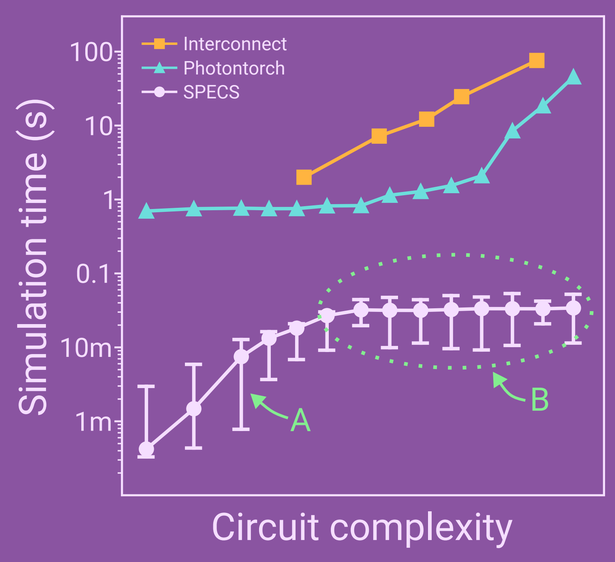


Is it accurate?

SPECS can match the results of tried and tested circuit simulators, such as Lumerical™ Interconnect or Photontorch, while being better at handling sub-timestep delays, avoiding numerical errors that can corrupt Interconnect's results at low temporal resolutions.

Is it fast?

SPECS is generally orders of magnitude faster in time-domain simulations of digitally controlled circuits, unless the circuit has a high activity rate (temporal and spatial saturation), a rare case in large photonic circuits.



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