CSuprem is a powerful and accurate 2D/3D process simulation tool for silicon and GaAs.

- Extension of Stanford code to 3D.
- Non-uniform temperature annealing.
- Data interface to Crosslight/Apsys simulator.
- Local heating profile imported from APSYS.
- Interface to Monte-Carlo implant simulator.
- Capability of CSuprem extended to compound devices:
  1. Deposition/Etching model adapted to model complex electrode design of light-emitting diode (LED).
  2. Strain/stress analysis applied to MQW GaN LED growth.

CSuprem Capabilities:

- Ion Implantation
  - Physical model
  - Damage model
  - Tilt model
- Anisotropic and Sacrificial Etching
- Deposition
- Diffusion
  - Point defect based
  - Paired and unpaired diffusion of point defects models
  - Transient enhanced diffusion (TED) for damage and clustering
- Rapid Thermal Anneal
- Oxidation
  - Dry oxidation
  - Wet oxidation
  - Effect of HCl, Orientation on oxidation rate
  - Effect of doping level and pressure on oxidation rate

GaAs MESFET

![GaAs MESFET Simulation](image1)

Non-uniform temperature profile generated by laser beam pulse imported from Crosslight APSYS for annealing.

SiGe Stress Simulation

3D Mask Effects on Boron Implant Distribution

![SiGe Stress Simulation](image2)

![3D Mask Effects on Boron Implant Distribution](image3)
3D CMOS image sensor simulated from process to FDTD-optics and electrical response.

GaN LED set up by CSuprem

3D RF-MEMS Example

FINFET Example