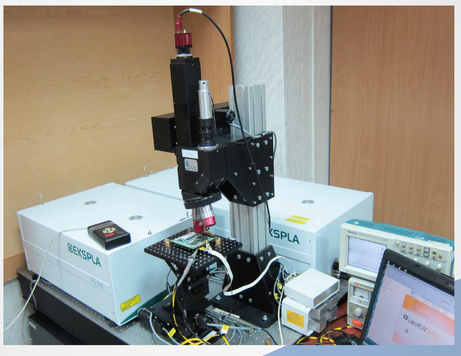
Laser Facilities for Radiation Effects Simulation and Testing

Single Event Effects Simulation and Test Facilities

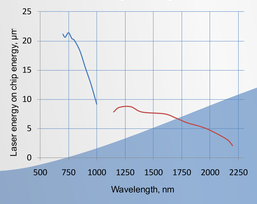
PICO-4 Laser Simulator



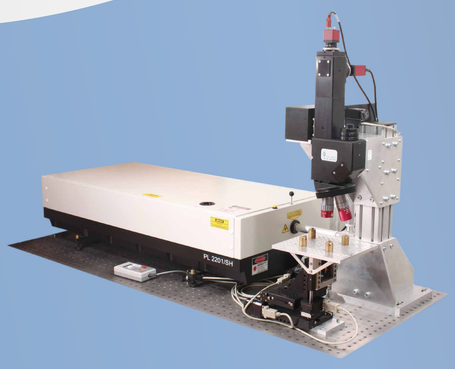
- includes special wavelength tuning module, based on optical parametric generator (OPG), allowing to vary laser irradiation wavelength
- wavelength range 700...1000 nm to simulate the effects produced by particles with different penetration depths
- wavelength range 1150...2200 nm to utilize two-photon absorption in silicon (backside chip irradiation)

Laser type	picosecond DPSS Nd^{3+}:YAG + BBO OPG module
Pulse duration	25 ps
Max pulse energy (on chip)	~ 20 μJ (@ 750 nm)
Pulse repetition rate	from single shot to 1000 Hz
Spot size	min. 3 μm ($1/e^2$)
Wavelength tuning	Motorized PC controlled

Wavelength tuning curve

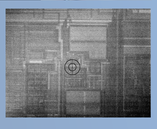


PICO-3 Laser Simulator

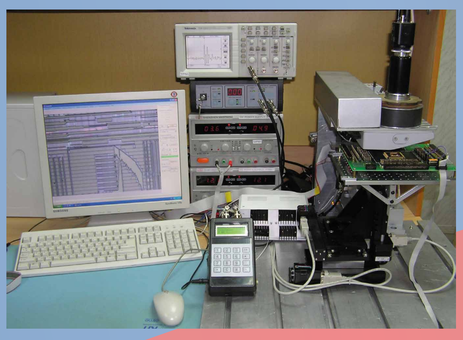


- Compact, stable and reliable picosecond laser sourse High-precision PC-controlled XYZ translation stage
- Two visualization channels with high-resolution color
- and Near-infrared cameras for top-side and back-side visualization

Laser type	picosecond DPSS Nd^{3+}:YAG
Wavelength	1064 / 532 nm
Pulse duration	70 ps
Max pulse energy (on chip)	8 / 3 μJ
Pulse repetition rate	from single shot to 1000 Hz
Spot size	min. 2.2 / 1.2 μm ($1/e^2$)
Device positioning system	PC controlled XYZ stage, min. step 0.1 μm, travel range 100x100x25 mm

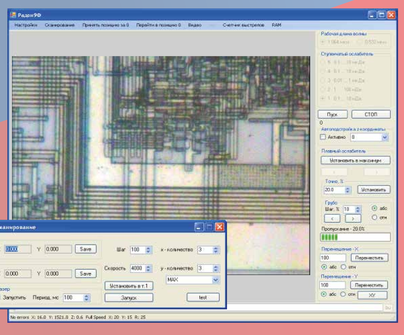


RADON-9F Portable Laser Simulator

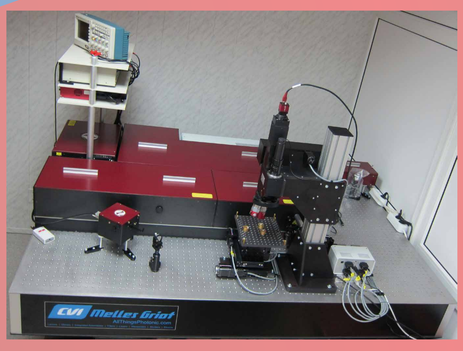


Portable design with nanosecond laser source, integrated into focusing unit (microscope)

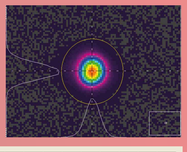
Laser type	Nanosecond Q-switched, Nd^{3+}:YAG
Wavelength	1064 nm
Pulse duration	10 ns
Max pulse energy (on chip)	10 μJ
Pulse repetition rate	from single shot to 10 kHz
Spot size	min. 2.5 μm ($1/e^2$)
Device positioning system	PC controlled XYZ stage, min. step 0.1 μm, travel range 100x100x25 mm
Special mounting / alignment constraints	max. device/PCB size 200 mm, microobjective working distance ~10 mm



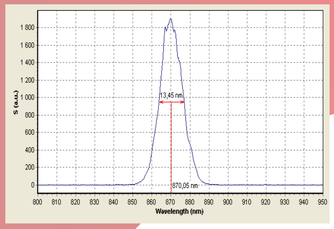
FEMTO-1 Laser Simulator



- wavelength 870 nm
- Variable pulse duration from 70 fs to 10 ps
- Excellent beam quality (TEM00) M2<1.3
- Intagrated pulse monitoring system (pulse wavelength and duration)

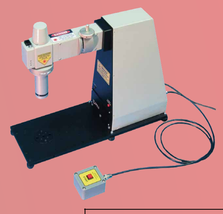


Laser type	femtosecond Ti3+:sapphire
Wavelength	870 nm
Pulse duration	70 fs…10 ps
Max pulse energy (on chip)	20 μJ
Pulse repetition rate	from single shot to 100 Hz
Spot size	<2 μm ($1/e^2$)
Device positioning system	PC controlled XYZ stage, min. step 0.1 μm, travel range 100x100x25 mm



Dose Rate Effects Simulation and Test Facilities

Portable Laser Simulator RADON-10



- good laser energy stability and beam profile
- internal laser energy indicator
- attenuation system including two-decade step laser energy attenuator and fine attenuator within two decades
- changeable beam collimators with different beam sizes

Laser type	Q-switched Nd^{3+}:YAG
Wavelength	1064 / 532 nm
Pulse duration	7…9 ns
Max pulse energy	30 / 10 mJ
Pulse repetition rate	0,2 Hz or single shot mode
Spot size	3…15 mm
Device positioning system	manual

RADON-8 Laser Simulator

Laser type	Q-switched Nd^{3+}:YAG, Ti:Sapphire(Ti^{3+}:Al_2O_3)
Wavelength	1064 / 532 nm, 700…1000 nm
Pulse duration	7…9 ns
Max pulse energy	150 / 70 mJ, 30 mJ
Pulse repetition rate	10 Hz or single shot mode
Spot size	6…36 mm
Devicepositioning system	manual
Specialmounting/ alignment constraints	maxdevice/PCBsize 250 mm

RADON-8 combines powerful nanosecond LQ-529 laser source and LX-314 nanosecond tunable wavelength Ti:Sapphire laser source.

LX-314 tuning curve