Plan for Laser System @ Kyushu

ECAL Meeting in Tokyo

2012/12/18

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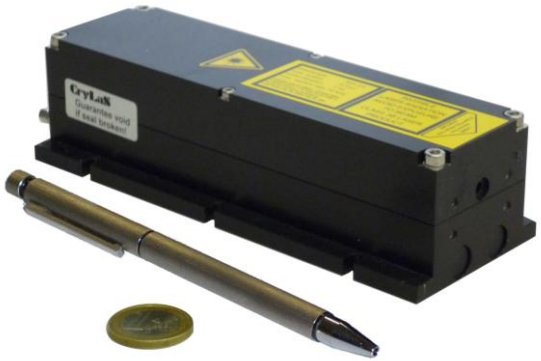
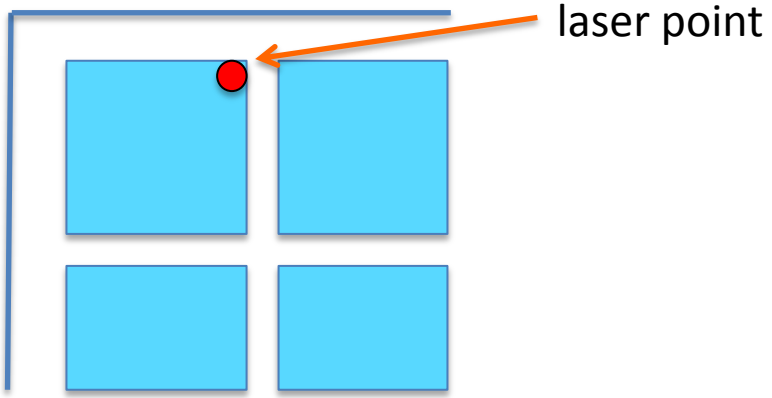
Motivation

Microscope + Laser
→ make small radius laser light ~10μm
→ We can inject laser light anywhere in one pixel
→ Cross talk measurement, Edge effect

High power Laser
→ We can control number of e-h pair production by adjusting the yield of laser light

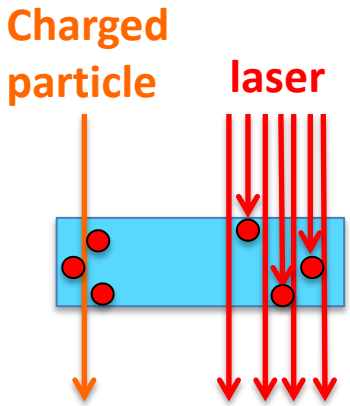




Signal Production by Infrared Laser

Wave length **1064 nm = 1.16 eV**

Energy gap of Si = 1.12 eV
Average production energy of **e-h pair = 3.6 eV**

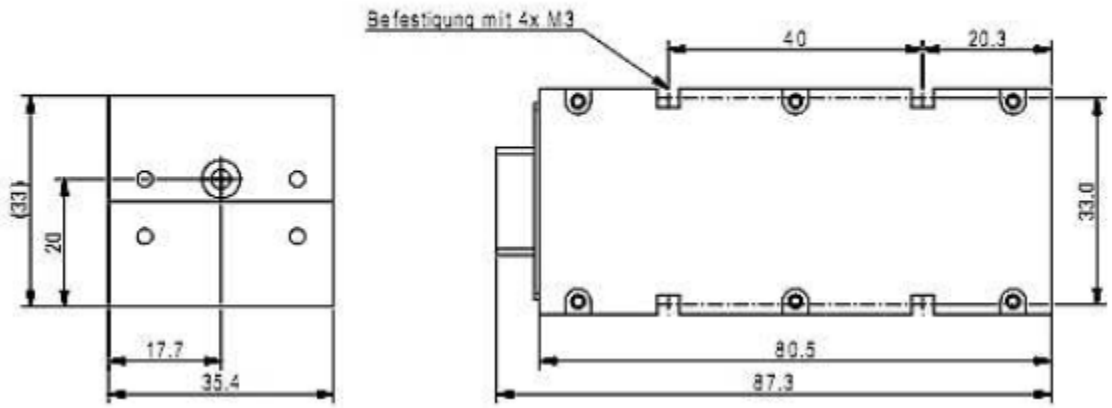


Almost all laser light go through a Si sensor, but they can make e-h pair a certain probability.
→We can make e-h pair uniformly in a sensitive area.

Spec. of The Laser

CRYLAS GmbH
DSS1064-Q2 (Class 3B)
Wave length : 1064 nm
Pulse width : ~ 1.5 ns
Pulse energy : > 20 µJ/pulse
~ 10^{14} photons/pulse
Peak power : > 13kW
Reputation rate : 1 ~ 10kHz

87.3 x 35.4 x 33 mm

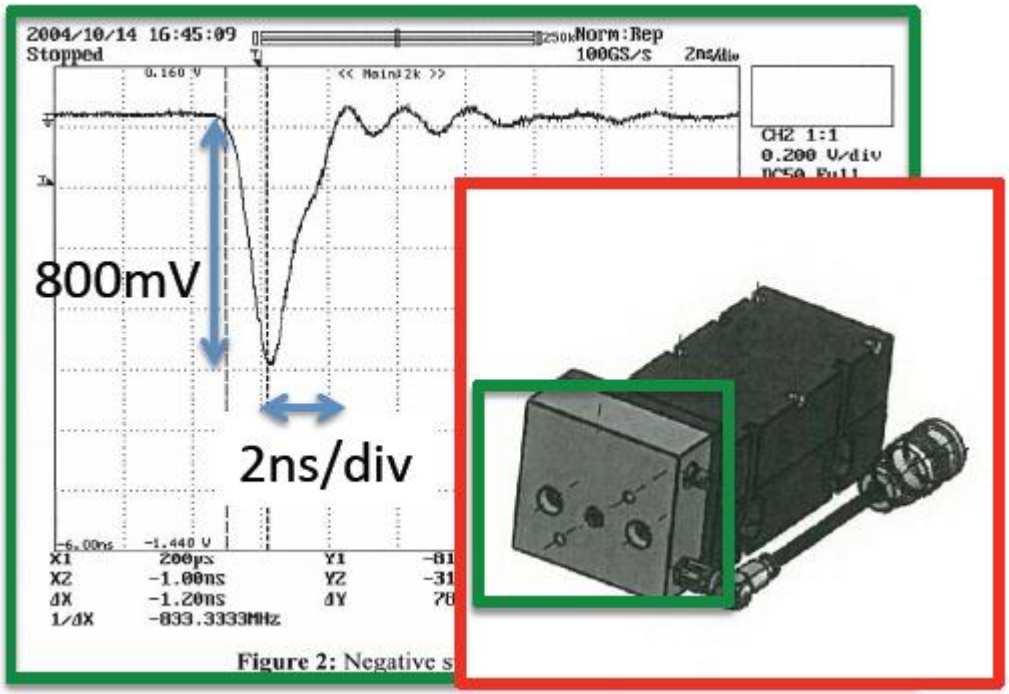


How to Control

- We can easily control the laser reputation rate with Windows software.
- There is a triggering system as an option of the laser.
- A trigger signal is negative 800 mV and 2ns width

Interface of the control software

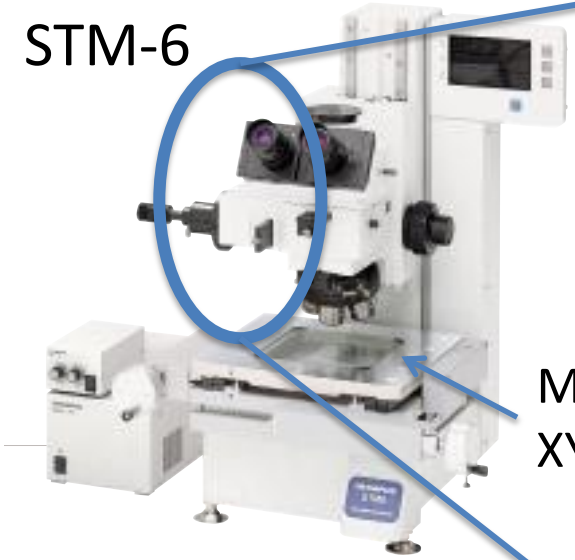
Trigger signal

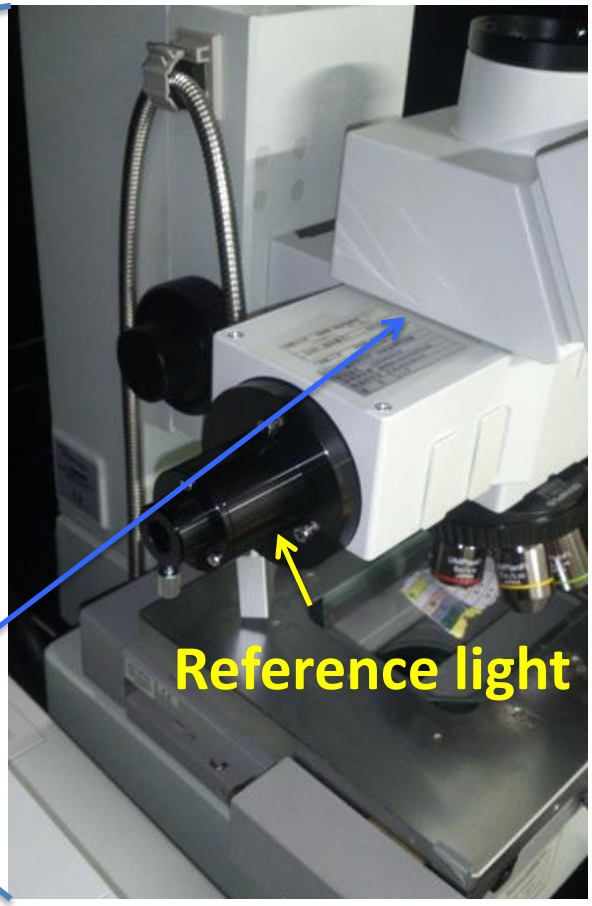


Optical system 1: Microscope

Olympus : STM-6

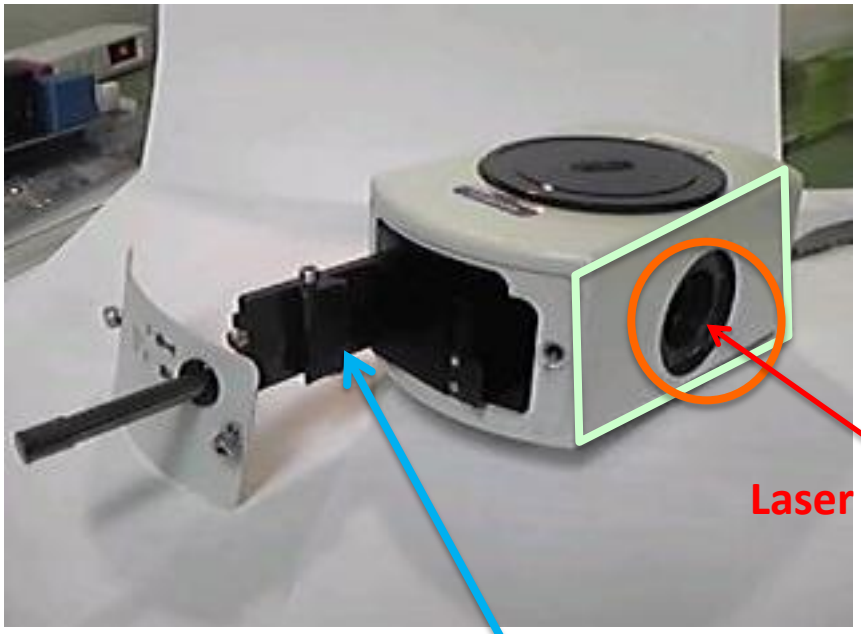
CCD camera

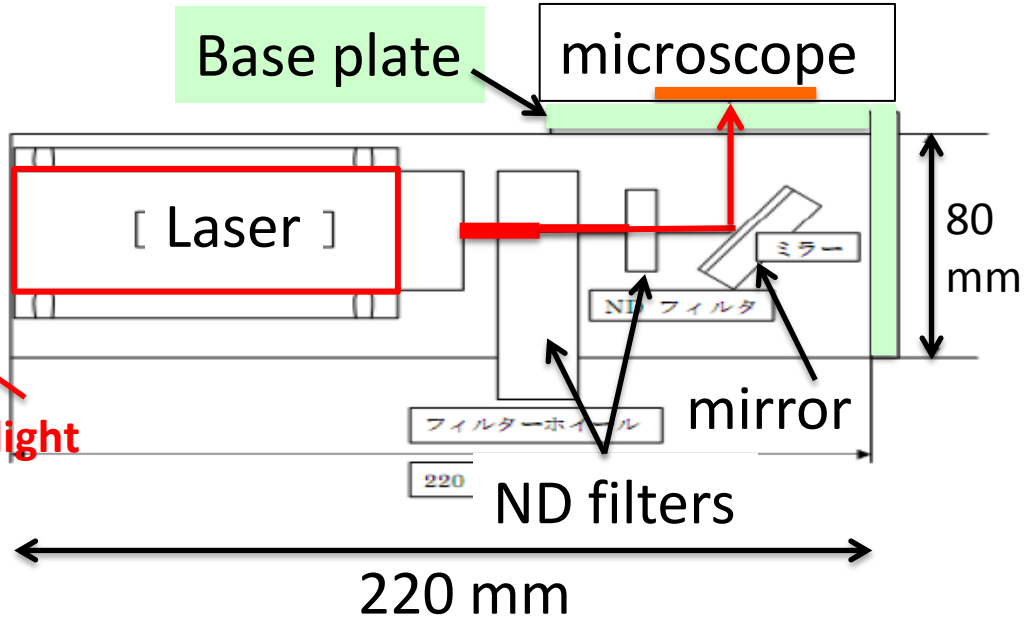




Objective lens
x5, x20
and x100

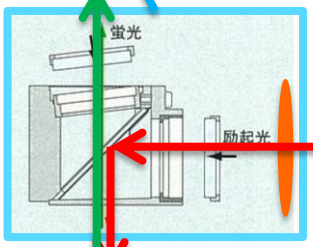
Optical System 2 : Light Guide





Laser light

Put mirror unit
Into a part of
Microscope unit



Laser light 1064nm

Visible light

We have to

- make a new Si sensor box optimized for the laser system
- make a signal read out system
- prepare daq system