

# *Set-up*

## Lasers:

- $\lambda=670\text{nm}$  (lenses)
- $\lambda=1060\text{nm}$  (optical fibre)

## Cooling:

- Peltier cooling ( $T=0\text{-}40^\circ\text{C}$ )
- Cryostat cooling ( $T= -190^\circ\text{C}$  to RT)

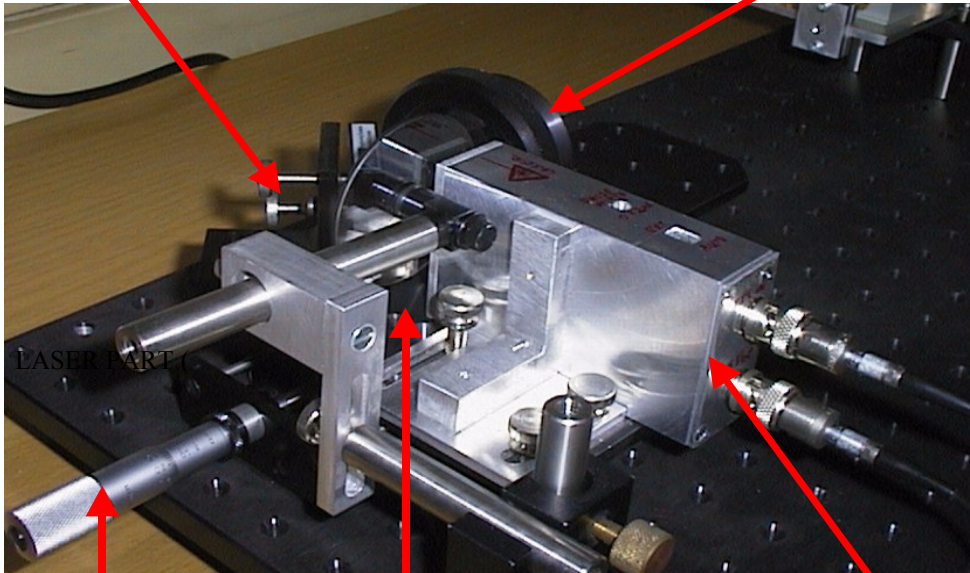
## Read out:

- fast current amplifier
- digital oscilloscope (500 MHz)
- full computer control

## LASER PART ( $\lambda=670$ nm)

**BEAM  
STEERING**

**FOCUS OPTICS**  
f100  $\phi$ 50 plano  
convex lens



**FOCUSING  
TRANSLATOR**

**CIRCULAR  
NEUTRAL DENSITY  
FILTER**  
Optical Dens. 0-3

**DRIVER**  
six paralel Advanced High-  
Speed CMOS Schmitt  
Triger  
inverters (SN54AHC14)  
**LASER**  
Toshiba TOLD9221M  
600-700 nm, 50 mW max.

**Spot size at sample  $\cong 100$   $\mu$ m**

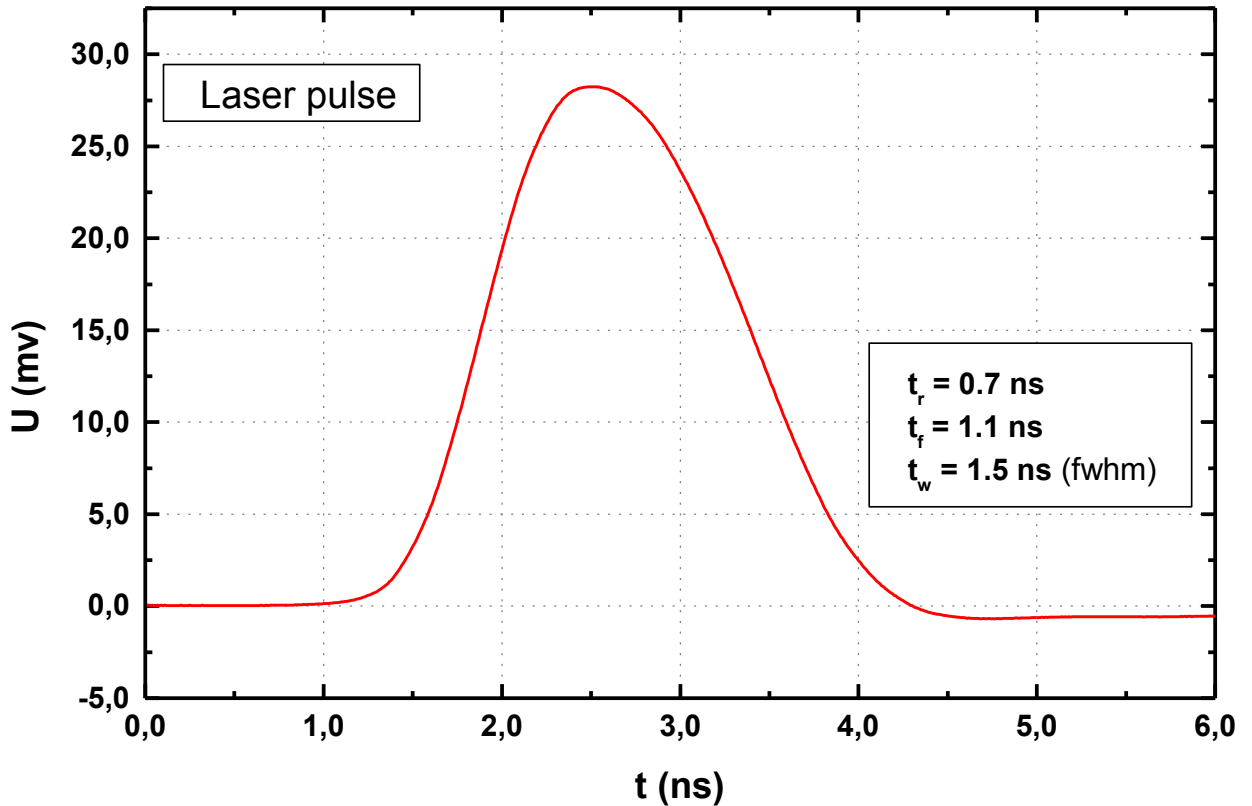
## LASER PART ( $\lambda=1060$ nm)

DRIVER same as for the red laser (1 ns) !

Optical fibre used for the beam transport!

Light cone at the output around  $20^\circ$ !

# PULSE FROM LASER SET-UP

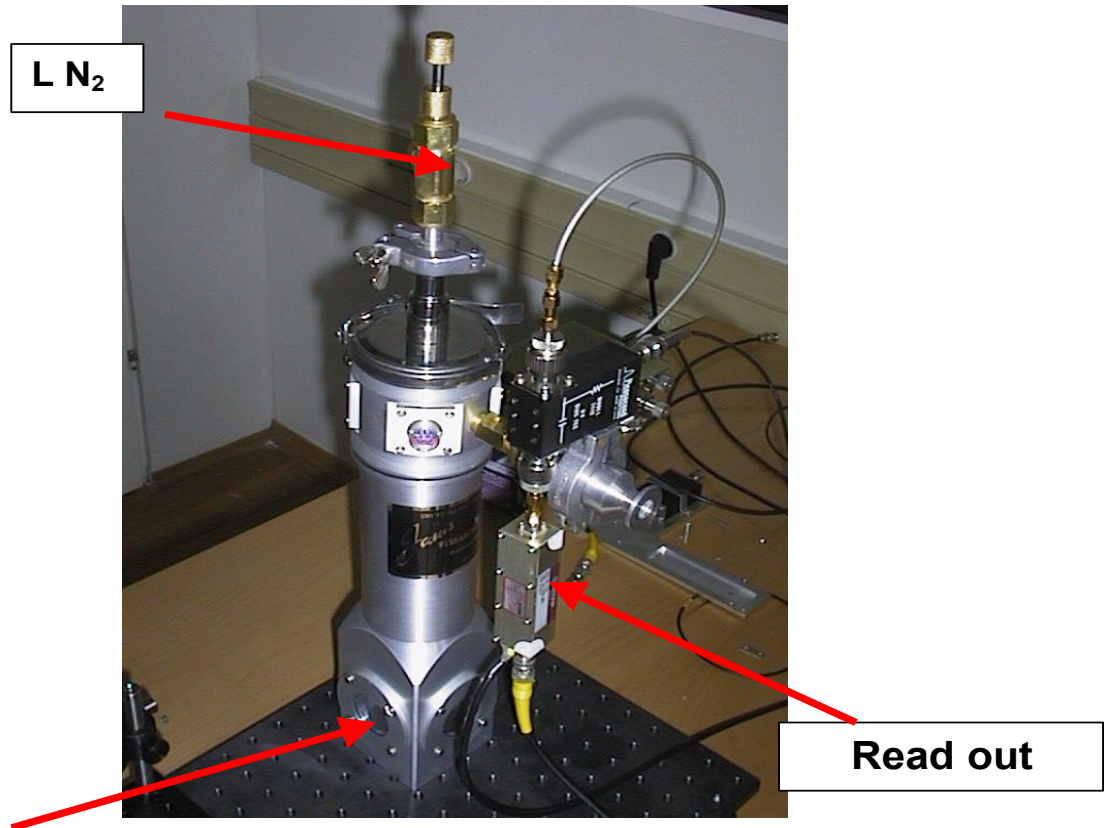


**measured with**

- Opto-Electronics ltd. LD10 photodetector
- Tektronics TDS 754 C (500MHz, rep on, avg 5)

# CRYOSTAT

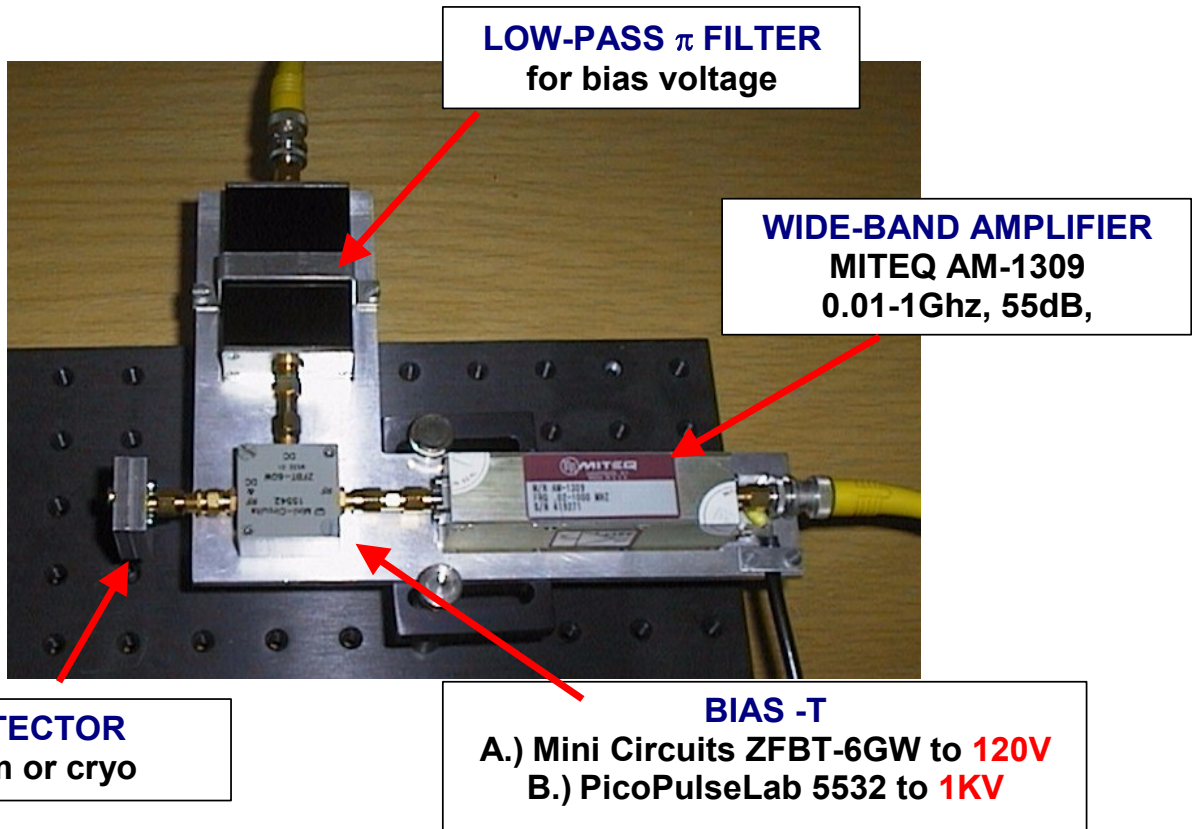
Janis VPF-100 LN<sub>2</sub> pourfill cryostat  
(from 77K to 373K)



## Peltier cooling

Custom made thermostat driver  
(from 273K to 313K)

## READ-OUT



### SYSTEM INDUCED FREQ. LIMITATIONS:

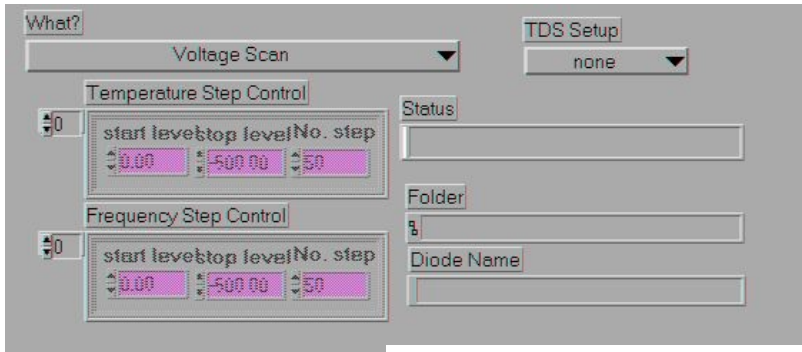
- Amplifier  $f_b = 10 \text{ kHz}$ ,  $f_t = 1 \text{ GHz}$
- Bias-T  $6 \text{ kHz}$  to  $10 \text{ GHz}^{\text{A}}$  or  $150 \text{ kHz}$  to  $10 \text{ GHz}^{\text{B}}$
- Scope  $f_t = 500 \text{ MHz}$

### DETECTOR INDUCED FREQ. LIMITATIONS

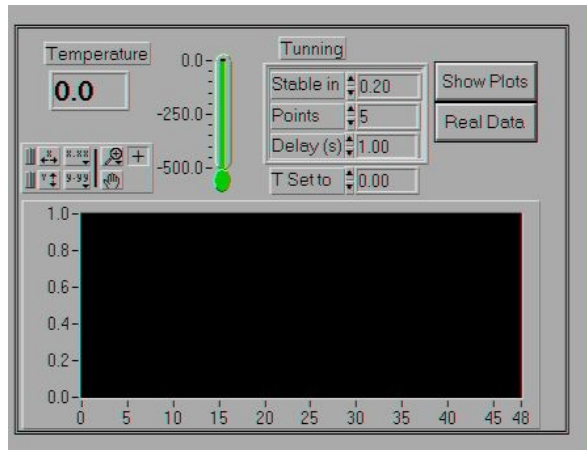
- $C_D = 15 \text{ pF}$ ,  $R_{in} = 50 \Omega \rightarrow t_{r(\text{max})} = 1.57 \text{ ns}$  ( $t_r = 1/3f_t$ )
- Scope  $f_t = 500 \text{ MHz} \rightarrow t_{r(\text{max})} = 660 \text{ ps}$

# COMPUTER CONTROLE

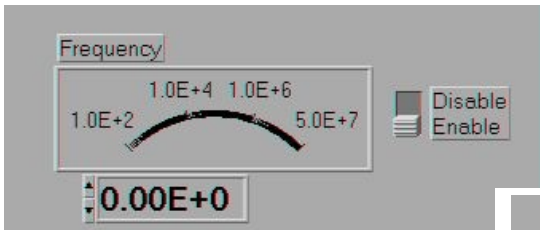
## Win98+LabView+GPIB



**TEMPERATURE CONTROL**  
Yokogawa UT15 + PT100 + 50Ω  
heater



**LASER CONTROL**  
HP 8116 A pulse gen. (TTL to laser logi)



**VOLTAGE SCAN**  
Keithley 2410 IV meter

