# Calibration at an angle


The step-by step procedure which was used yesterday is as follows.

- Calibration at normal incidence verified:
  - pump power set at a low value for calibration,
  - the polarization of the pump was horizontal (p-polarization),
  - calibration piece mounted with the coating at its front side,
  - the point on the surface selected to be close to rotation axis of the holder to ensure that after rotation the pump/probe crossing will be close to the rotated surface,
  - calibration piece selected from the list of materials,
  - Imaging Unit (IU) Z-axis position set for 3 mm-long sample,
  - DC maximized with XY screws of the IU,
  - vertical scan made for 2 mm distance,

- median value of responsivity taken (software version 7.6 and later does it automatically when the surface calibration piece is chosen from the list of materials),


- the result was R = 33.8 (1/W).

- Sample rotated to 45 deg angle, probe side.
- The DC adjusted to maximum with XY screws of the IU. The maximum DC value was lower than for the normal incidence: 2.64 V instead of 3.08 V for the normal incidence. That is expected since the polarization of probe is vertical, s-polarization.
- Responsivity maximized:
  - DAQ monitor window launched to observe the signal, calibration activated (software version 7.6 and later automatically switches to responsivity units when the material selection is the calibration piece),
  - Z-motor of the XYZ scanning stage moved by 0.1 mm increments (cursor placed after the corresponding digit, keyboard up and down arrow keys used to move the piece),
  - at the location of the biggest signal, smaller increments were used to find the maximum.
- Vertical scan made again:
  - the median value for responsivity was R = 29.5 (1/W).


The ratio of responsivities 29.5/33.8 = 0.87 in this test.
Other test parameters:

- Wavelength 355 nm.
- Pump power 6.9 mW.
- Probe beam diameter* 225 μm.
- Pump beam diameter* 68 μm.

*Tested with a simple knife-edge technique. The criterion is 10%-90%. The formula for the radius is w = [X(90) - X(10)]/1.28 where X(90) is the position of the edge when 90% of light is transmitted, X(10) is for 10% transmission. The diameter will be 2 times larger.