Raw data repository for the article: Influence of Contacts and Applied Voltage on a Structure of a Single GaN Nanowire

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The archive **NWrawdata.zip** contains information about the raw data collected at P10 beamline at PETRA III during this experiment, which is shown in Figs. 4, 5, and 6 of the main text.

Experimental parameters:

X-ray energy: 9.040 keV
Beamsize: ~2.07 x 2.964 μm (h x v)
Beamflux: ~10^{11} photons/second
Detector size: 2070 x 2167 pixels (h x v)
Detector pixel size: 75 x 75 μm^2
Sample-detector distance: 1740.5 mm

Right hand geometry:
x: x-ray direction
y: horizontal direction of detector
z: vertical direction of detector

Folder: Fig4ab_PE_950_NW17_2_0V_00015

Figure 4(a,b): Single NW of the 350 nm diameter.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0 (detector horizontal rotating angle, counterclockwise)
om: 12.68 (center, incidence vertical rotating angle, clockwise)
dscan om -0.3 0.5 159 1 0 2 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig4cd_PE_949_NW14_00023

Fig. 4(c,d): Single NW of the 200 nm diameter.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0 (detector horizontal rotating angle, counterclockwise)
om: 12.94 (center, incidence vertical rotating angle, clockwise)
dscan om -0.6 0.6 199 15 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig4ef_PE_950_NW1_1_1.0V_00006

Figure 4(e,f): Two NW's of the 350 nm diameter.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0 (detector horizontal rotating angle, counterclockwise)
om: 12.45 (center, incidence vertical rotating angle, clockwise)
dscan om -0.4 0.4 100 1 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig5a_PE-950_00040

Fig. 5(a): Contacted NW's. The contacts deposited on the top of the nanowires with the diameter of 350 nm.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.5 (detector horizontal rotating angle, counterclockwise)
om: 12.88 (center, incidence vertical rotating angle, clockwise)
dscan om -0.5 0.5 250 7 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig5b_PE_949_NW14_00029

Fig. 5(b): Contacted NW's. The contacts deposited on the top of the nanowires with the diameter of 200 nm.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.45 (detector horizontal rotating angle, counterclockwise)
om: 12.60 (center, incidence vertical rotating angle, clockwise)
dscan om -0.6 0.6 199 5 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig5c_LFM1D6_00106

Fig. 5(c): Contacted NW's. A NW with the diameter of 200 nm contacted on the top of the Au electrodes by melting procedure.

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.25 (detector horizontal rotating angle, counterclockwise)
om: 12.30 (center, incidence vertical rotating angle, clockwise)
dscan om -0.6 0.5 109 10 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig6a_PE-950_00028

Fig. 6(a): Evolution of the intensity distribution around Bragg peak with the applied voltage of a contacted GaN NW with the diameter of 350 nm. Applied voltage: **0.1 V.**

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.00 (detector horizontal rotating angle, counterclockwise)
om: 12.68 (center, incidence vertical rotating angle, clockwise)
dscan om -0.7 0.7 100 5 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig6b_PE-950_00029

Fig. 6(b): Evolution of the intensity distribution around Bragg peak with the applied voltage of a contacted GaN NW with the diameter of 350 nm. Applied voltage: **0.5 V.**

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.00 (detector horizontal rotating angle, counterclockwise)
om: 12.68 (center, incidence vertical rotating angle, clockwise)
dscan om -0.7 0.7 100 5 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig6c_PE-950_00030

Fig. 6(c): Evolution of the intensity distribution around Bragg peak with the applied voltage of a contacted GaN NW with the diameter of 350 nm. Applied voltage: **1 V.**

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.00 (detector horizontal rotating angle, counterclockwise)
om: 12.68 (center, incidence vertical rotating angle, clockwise)
dscan om -0.7 0.7 100 5 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Folder: Fig6d_PE-950_00031

Fig. 6(d): Evolution of the intensity distribution around Bragg peak with the applied voltage of a contacted GaN NW with the diameter of 350 nm. Applied voltage: **2 V.**

Beamline parameters:

del: 29.5 (detector vertical rotating angle, clockwise)
gam: 0.50 (detector horizontal rotating angle, counterclockwise)
om: 12.68 (center, incidence vertical rotating angle, clockwise)
dscan om -0.7 0.7 100 5 0 1 (initial scan angle, final scan angle, number of points in the scan, number of accumulation frames, delay time, exposure time in seconds)

Each folder has text fio files which contains an information about the scan motor position, and h5 files which contain the image file of the measurement.

The archive NWrawdata.zip contains also the following files:
OpenDataProgram.m – the MATLAB main program, which allows to open images from h5 files.
openmutieiger4m.m - the MATLAB function program, which allows to open the full images measured with the Eiger4M detector from h5 files.
openmultieiger4m_roi.m - the MATLAB function program, which allows to open the ROI images measured with the Eiger4M detector from h5 files.