NXoptical_spectroscopy implementation for UDynl

NXoptical_spectroscopy application definition
NXoptical_spectroscopy_application_definition_xml

Legend
🔴 = **Required** in NXoptical_spectroscopy
🟡 = **Recommended** in NXoptical_spectroscopy
🟢 = **Optional** in NXoptical_spectroscopy
🔵 = **Added to the original application definition**
📁 = HDF5 **Group**
📊 = HDF5 **Dataset**
@ = HDF5 **Attribute**

Note: when a group has TYPE in its name, the word TYPE can be substituted with anything, here are proposed some possible naming conventions.

IMPORTANT NOTE: in this implementation all the specified fields are required.

🔴📁 ENTRY (NXentry)
- 🔴📊 definition (NX_CHAR)
  - 🔴@URL (NX_CHAR) (URL of chosen application definition)
  - 🔴@version (NX_CHAR)
- 🟡📊 title (NX_CHAR)
- 🟡📊 start_time (ISO8601 date/time stamp with explicit time zone)
- 🟡📊 end_time (ISO8601 date/time stamp with explicit time zone)
- 🟡📊 identifier_experiment (NX_CHAR)
- 🟢📊 experiment_description (NX_CHAR)
- 🔴📊 experiment_type (NX_CHAR) (one of the following:
  - photoluminescence
  - transmission spectroscopy
  - reflection spectroscopy

)
- 🟢📊 experiment_sub_type (NX_CHAR) (one of the following:
  - time resolved
  - imaging
  - pump-probe

)
- 🔴📁 INSTRUMENT (NXinstrument)
  - 🔴📁beam_TYPE (TYPE=wavelength_of_the_source) (NXbeam)
    - 🔴📊 parameter_reliability (NX_CHAR) (one of the following:
      - measured
      - nominal

)
    - 🟡📊 incident_wavelength (NX_NUMBER)
      - 🔵@units (NX_CHAR)
    - 🟡📊 incident_polarization (NX_NUMBER)

🟢📊 associated_source (NX_CHAR) (path to the device that emitted the beam)

🟢📊 beam_polarization_type (NX_CHAR) (one of the following:

- linear
- circular
- elliptically
- unpolarized

)

🔵📊 beam_type (NX_CHAR) (one of the following:

- pump
- probe

)

🔴📁 detector_TYPE (TYPE=detector_type) (NXdetector)

🔴📊detector_channel_type (one of the following:

- single-channel
- multichannel

)

🟡📊detector_type (NX_CHAR) (one of the following:

- CCD
- photomultiplier
- photodiode
- avalanche-photodiode
- streak camera
- bolometer
- golay detectors
- pyroelectric detector
- deuterated triglycine sulphate

)

🟡📁 source_TYPE (NXsource)

🟡📊 type (NX_CHAR) (one of the following:

- Synchrotron X-ray Source
- Rotating Anode X-ray
- Fixed Tube X-ray
- UV Laser
- Optical Laser
- Laser
- Dye-Laser
- Broadband Tunable Light Source
- Halogen lamp
- LED
- Mercury Cadmium Telluride
- Deuterium Lamp
- Xenon Lamp
- Globar

)

🔴📁 SAMPLE (NXsample)

🔴📊 name (NX_CHAR)

🟡📊 sample_id (NX_CHAR) (locally unique ID for the sample)

🔴📁 DATA (NXdata)

- 🔴📊 axis1_name (one dimensional array of values)
  - 🟢@long_name (NX_CHAR)
  - 🟢@units (NX_CHAR)

- …
- 🔴📊 axisN_name
- 🔴📊 signal (the values of the N-dimensional matrix)
- 🔴@axes = (NX_CHAR) [axis1_name, …, axisN_name]
- 🔴@signal (NX_CHAR)
- 🟢@reference (NX_CHAR) (path where the signal data is stored)