SPEC Macros for REIXS Beamline

Elliptically polarized undulator (EPU) macros

- **setEPU** *epu_comp value* [*angle*]

  Options for *epu_comp*: *polar, harmo*, or *offset*
  value for *polar*: *cl*, *cr*, *lh*, *lvp*, *lvn*, or *li* — for circular left, circular right, linear horizontal, linear vertical +, linear vertical –, or linear inclined angle with [*angle*] is between –90 to +90 (degrees). Circular polarization is available for the **first** harmonic only.
  value for *harmo*: *1*, *3*, or *5*
  value for *offset* in mm

Monochromator macros

- **moveE** *energy* — moves to the specified *energy* in eV

  Options for *energy*: *300 – 3000* eV — for Au HEG
  95 – 800 eV — for Ni LEG
  95 – 250 eV — for Au LEG

- **moveG** *grating* — moves *grating* with options of *AuHEG*, *NiLEG*, or *AuLEG*
- **moveM** *mirror* — moves *mirror* with options of *Nickel*, *Silicon*, *Gold*, or *Carbon*
- **setE** *energy_in_eV* — used for setting user energy at the current monochromator position

Beam status macros

- **setBEAM** *state* — ensures availability of beam with *state* options of *on* or *off*
- **chkBEAM** *parameter* [*state*]

  Options for *parameter*: *ring, psh*, or *vvr* with [*state*] of *on* or *off* — checks ring state and safety shutters, state of photon shutters, or state of gate valves
  on or *off* — turns all above parameters on or off
  status — displays status of checking

Beamline components (apertures, diagnostic stages, 4jaws, exit slit) macros

- **setBL** *bl_comp value*

  Options for *bl_comp*: *vahgap, vavgap*, *esgap*, *bds3*, or *bds4*
  value for *vah* and *vav* in mm — variable aperture horizontal and vertical gap in mm
  value for *bds3*: *out*, *yag*, or *au* — beam diagnostic stage 3 (out, YAG, or Gold mesh)

- **getBL** *bl_comp* — options for *bl_comp*: *vah, vav, or bds3*
- **setES** *value* — value in um for Exit slit vertical gap

Photon shutters and gate valve macros

- **setPSH** *state* — open or close beamline shutter with *state* options of *on* or *off*
- **statPSH** — displays state of photon shutter
- **setVVR** *state* — open or close endstation gate valve with *state* options of *on* or *off*
- **statVVR** — displays state of endstation gate valve

Current amplifiers macros

- **setAMP** *mne value* — with *mne = tey* or *i0* and sensitivity *value* options is either *up* or *down* for relative change or exact value for example *1pA/V* or *2nA/V*.
  Notes: The exhaustive list of sensitivity are 1, 2, and 5 with a range of 1 mA/V to 1pA/V and all orders of magnitude in between.
- **statAMP** — displays the current sensitivity of both amplifiers

Special scanning macros

- **Escan** *start1 end1 intervals1* [*end2 intervals2 …*] *time* [*fixQ*]

  Notes: **Escan** works for single and multiple region energy scan with and without [fixQ]. For fixQ energy scan (only available for FOURC), it is better to scan from high to low energy.
- **elmesh** *Estart Efinish intervals_1 Lstart Lfinish intervals_2 time* — Energy – L mesh (only FOURC)
- **ehmesh** *Estart Efinish intervals_1 Hstart Hfinish intervals_2 time* — Energy – H mesh (only FOURC)
- **Tscan** *time_interval total_time*

RSXS detector filters and slits selection

- **slitselect** *slit_number detector_name*

  Option for *slit_number*: 1 to 10 with *detector_name* of either *cht* (for channeltron) or *pd* (for photodiode).

Silicon drift detector (SDD) multi channel analyzer (MCA) and region of interest (ROI) macros

- **setSDD** *state* — acquiring or not acquiring SDD MCA with *state* options of *on* or *off*
- **setSDD** *roi roi_num low_energy high_energy* — acquiring SDD ROI SCA with *roi_num* of *1*, *2*, or *3* and the energy range from *low_energy* to *high_energy*

Microchannel plate (MCP) 2D image and region of interest (ROI) macros

- **setMCP** *state* — acquiring or not acquiring MCP 2D image with *state* options of *on* or *off*
- **setMCP** *roi roi_num tth1p tth2p detz1p detz2p* — with *roi_num of 1* or *2* and the two-theta range in pixel from *tth1p* to *tth2p* and the detector height range in pixel from *detz1p* to *detz2p*