Pre-Positioning the NIRSPEC internal rotator to match an on-sky Observation:

Equation to Calculate the NIRSPEC Rotator **PHYSICAL ANGLE** for a given **Slit PA** on the sky:

IROTPOS = 0.5 x (SLITPA – SLITANG – OFFSET – PARANG – EL)

Definitions:

(Note, these values are recorded in the FITS headers for SPEC and SCAM images)

IROTPOS = Physical Angle of NIRSPEC rotator
(Range = +/– 90 degrees)
Same as position (VAL) in Rotator detail GUI

SLITPA = Desired position angle for the slit on the sky (degrees)
(e.g. North= 0, East= +90)

SLITANG = Installation angle for a given slit (degrees)
(see different cases below)

OFFSET = Constant value for NIRSPEC = –86.14 deg
(as located at Right Nasmyth focus on Keck II

PARANG = Parallactic Angle of the telescope (degrees in azimuth)

EL = Elevation Angle of the telescope (degrees from horizon)

SLITANG cases:

0.144x12 = +14.22 deg
0.288x12 = +14.13 deg
0.432x12 = +14.56 deg
0.576x12 = +14.58 deg
0.720x12 = +14.07 deg
0.288x24 = +12.33 deg
0.432x24 = +14.27 deg
0.380x42 = +88.04 deg
0.570x42 = +87.70 deg
0.760x42 = +87.69 deg

Example Calculation:

SLITPA = +96.14 (desired)
SLITANG = +12.33 (using the 0.288x24 slit)
OFFSET = –86.14 (constant for NIRSPEC at RNAS)
PARANG = +83.17 (specific to the observation on sky)
EL = +44.26 (specific to the observation on sky)

Gives IROTPOS = +21.26 (enter this as rotator VAL position)