PhoSim-NIRCam: Background

- PhoSim-NIRCam does have the capability to generate a sky background automatically, but this feature is still under testing. At the moment, an appropriate sky background needs to be added to the simulated image manually.

- First, estimate the sky background for the target field. For example, you can use the JWST Backgrounds Tool (https://jwst-docs.stsci.edu/display/JPP/JWST+Backgrounds+Tool).

- The pixel scale of the SW image is 0.031". If the expected background is 0.1 MJy/sr, the corresponding sky count in electron will be,

$$0.1e6 \times (\pi/180/3600 \times 0.031)^2 / (3631 \times 10^{(-0.4 \times 28.11)}) = 0.11 \text{ (e-/s)}$$

- The pixel scale of the LW image is 0.063". For the same background of 0.1 MJy/sr, the corresponding sky count in electron will be,

$$0.1e6 \times (\pi/180/3600 \times 0.063)^2 / (3631 \times 10^{(-0.4 \times 28.02)}) = 0.41 \text{(e-/s)}$$

- The simulated images produced by **mkimage** has an integration time of 600 sec. Therefore, a sky background of 66 and 246 e- were added to the F200W and F356W images, respectively, with the corresponding Poisson noise.

- We anticipate that PhoSim-NIRCam will be interfaced with the JWST Backgrounds Tool soon so that an appropriate sky background will be included in simulated images automatically, but until then, please add a sky background manually in a similar manner.