PhoSim-NIRCam: Known Issues & Development Plan

- **Known Issues:**

    - **Saturation**: The detector saturation level is currently set to 100,000 e-.   The current version of PhoSim-NIRCam will make saturated pixels bleed like CCD detectors, which is not the case for the NIRCam IR arrays.

    - **WCS:** The WCS parameters recorded in the FITS header correspond to those of the distortion-free image. This means that when the input source coordinates are plotted using the WCS in the image header, the plotted positions would not coincide with those of sources seen in the image, especially toward the edges of the FOV, where the effect of geometric distortion is significant (see the "JWST/NIRCam LW Field Distortion" image on the website).

    - **No detector/background noise**: PhoSim-NIRCam currently produces images with no detector/background noise (i.e., with source photon noise only). The Quick Guide **Background** describes how to calculate and insert an appropriate background signal in the simulated images.

- **On-going development**

    - Upgrade to PhoSim 4.0 (multi-threading, GUI, etc.)

    - Generate backgrounds inside PhoSim-NIRCam by using the existing PhoSim commands.

    - Add a capability to simulate NIRCam readout modes.

    - Include realistic detector noise by interfacing with pyNRC developed by J. Leisenring.

- **Features under consideration**

    - Interface with the JWST Backgrounds Tool for automatic sky background calculation.

    - Make the output file/header format consistent with that of the real NIRCam data so that the simulated data can be run through the NIRCam data processing pipeline.

    - Provide an option to produce WCS header parameters that incorporate geometric distortion.