PhoSim-NIRCam: How to run

- To test if PhoSim-NIRCam works properly on your machine, run the shell script **mkimage** in the top directory (**PhoSim-NIRCam**):

  ```
  $ ./mkimage &
  ```

  This will produce a simulated LW F356W image (Tint = 600 sec; containing ~1200 sources) with geometric distortion and diffraction-limited PSF (but without any detector or background noise) in the directory **output.lw_geo_diff**, together with the log file **log.lw_geo_diff**.   The runtime will typically be ~20 min for this example.

- The shell script **mkimage** contains other examples of how to run **phosim** with the simple wrapper **run_phosim**. Uncomment any of the lines to test other modes, such as producing SW F200W images or point-source (22 AB mag) images for deriving magnitude zero-points.

- In essence, running PhoSim-NIRCam only requires issuing a one-line command as follows:

  ```
  $ phosim <CatalogFile> —c <CommandsFile> —i <Channel>
  ```

  - **CatalogFile** (called instanceCatalog file by LSST/PhoSim) specifies the configuration of the observation (e.g., pointing coordinates, integration time) and astrophysical inputs (e.g., source coordinates, brightness, SED, morphology).

  - **CommandsFile** (called physicsCommands file by LSST/PhoSim) modifies the default physics in PhoSim.

  - **Channel** (called instrumentSiteDirectory by LSST/PhoSim) points to the directory that contains the relevant telescope/instrument (as well as site) characteristic files. In the case of PhoSim-NIRCam, this is either **nircam_sw** or **nircam_lw**.

- Here is an example command line that can be run inside the **phosim-nircam** directory:

  ```
  $ ./phosim nircam/phosim_lw.cat \\
         —c nircam/geo_diff —i nircam_lw
  ```

  Note that in this particular case, the CatalogFile (phosim_lw.cat) and CommandsFile (geo_diff) are located in the directory **nircam** (in **phosim-nircam**). This is essentially what **mkimage** does when used as distributed.

- PhoSim-NIRCam can also generate a sky background, but this feature is still under testing. At the moment, an appropriate sky background needs to be added to the simulated image manually (see the Quick-Guide **Background** for more detail).