NH-P/PSA-LORRI/MVIC/-5-GEOMAPS-V1.0

**CRITICAL LIENS**

* dataset.cat
  + The statement “32 bit pixel values were stretch to 8 bit”, which I repeated twice is not correct – the data are 32 bit. This should be corrected. Also “stretch” should be “stretched”. If possible, please include the 8 bit versions of the data as well.
  + Add references for the creation of the DTMs and mosaics. It seems likely that SCHENKETAL2017B and 2017B should be cited.
  + If the same images and process were used for both DTM and mosaic processing, state that clearly. If different processes were used, the descriptions for both need to be expanded to make the respective processes clear and distinct.
* albedo/ files

[Note from AR: These data looked like publication images, with scale bars and tick marks, as opposed to science images. Did we get the wrong files?]

* + 8bit files should include stretched values, or offset and multiplier.
  + Add IMAGE\_MAP\_PROJECTION and mission metadata as applicable.
  + Add MISSING\_CONSTANT keyword to define the “NoData” value that appears to be in use.
  + Remove scale bars and any other non-data “features” in the images.
* dtm/ files
  + File nh\_charon\_dtm.img: The line and sample offsets appear to be off by 1.5 pixels. Correct values seem to be “LINE\_PROJECTION\_OFFSET = 3173 <PIXEL>” and “SAMPLE\_PROJECTION\_OFFSET = 6346 <PIXEL>”. Please check and correct as needed.
  + File nh\_pluto\_dtm.img: The line and sample offsets appear to be off by 1 pixel. Correct values seem to be “LINE\_PROJECTION\_OFFSET = 6221.5 <PIXEL>” and “SAMPLE\_PROJECTION\_OFFSET = 12443.5 <PIXEL>”. Please check and correct as needed.
  + These images should be presented in 16bit signed integer format, with offset/scaling factor if needed, to present the image in a data type commensurate with the precision of the data.
* mosaic/ files
  + In both cases, the line and sample offset values should be checked to insure they do not suffer from the same problems as noted for the dtm/ files.
  + The 8bit versions of these files, referenced in the dataset.cat file but not provided, should be added to the dataset.
  + File nh\_pluto\_mosaic.img: The data appear to contain multiple values equivalent to “NoData”, instead of a single value to which all invalid pixels are forced. This does not seem appropriate for a mosaicked image, and the missing pixels should be forced to a single, common, MISSING\_CONSTANT value rather than using CORE\_\* values in a non-QUBE label.

[Note from AR: The above comment regarding labeling applies to both files, but the Pluto image actually appears to contain multiple “missing” pixel values. In general, CORE\_\* keywords should not be used outside of QUBE objects, and they should certainly not be included in an IMAGE object if they are not actually applicable to the data, since they reduce the dynamic range of the data.]

**ADDITIONAL LIENS**

* dataset.cat
  + There is a reference to “vertical resolutions as high as 100 m”, but it is not clear what the meaning of this is. Is this a precision? If so, why is the DTM in floating point? Is there a missing reference?
  + Lines 43, 47, 48: The given stretch values for Pluto and Charon do not match the actual range of values found in the data files.
  + Lines 50-81 and 133-164: The text in both these sections is identical. Is that correct? [AR: If so, a remark to that effect would be appropriate, rather than repeating the text.]
  + Lines 79-81: state that the photometric correction was performed with the Lambert model, but do not mention to what standard geometry the correction was made. This must be specified in order to make the absolute values in the mosaics meaningful.
* albedo/ files
  + The Bond albedo maps contain 8-bit data without any definition of units.
* dtm/ files
  + Please add DERIVED\_MAXIMUM, DERIVED\_MINIMUM, and UNIT (if appropriate) to IMAGE objects. [AR: This makes it easier for display software to scale. DERIVED\_MAXIMUM is the maximum data value from the file *after* scaling factor and offset have been applied. If there is no scaling factor or offset, of course, it’s just the maximum valid value in the file. Similarly for DERIVED\_MINIMUM.]