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29 Sep 2023

Assessment of Phoebe

       This document contains products used to asses the quality of the Phoebe global DTM in this bundle. Phoebe has an imaging campaign that would be classified as sufficient, but not ideal, for SPC. Details of the assessment data found in productdescription.txt should be read before proceeding.

       Below are figures of the assessment data, along with a short exposition on the quality of each. Figures of radius and albedo are included, and are annotated with black lines. Regions equatorward of the black lines are reliable, while those poleward of the black lines are suspect. The Phoebe global DTM was generated with the intent to extract as much information as possible from the spacecraft images, no matter how little is available. For some data user tasks "something is better than nothing," while for other data user tasks "no data is better than questionable data." We leave the decision to the data user to determine which category best fits their task. All figures shown here are available in the bundle as digital files that can be used for quantitative purposes. For assessment figures, the grayscale progression has been adjusted so brighter regions always represent better quality data.
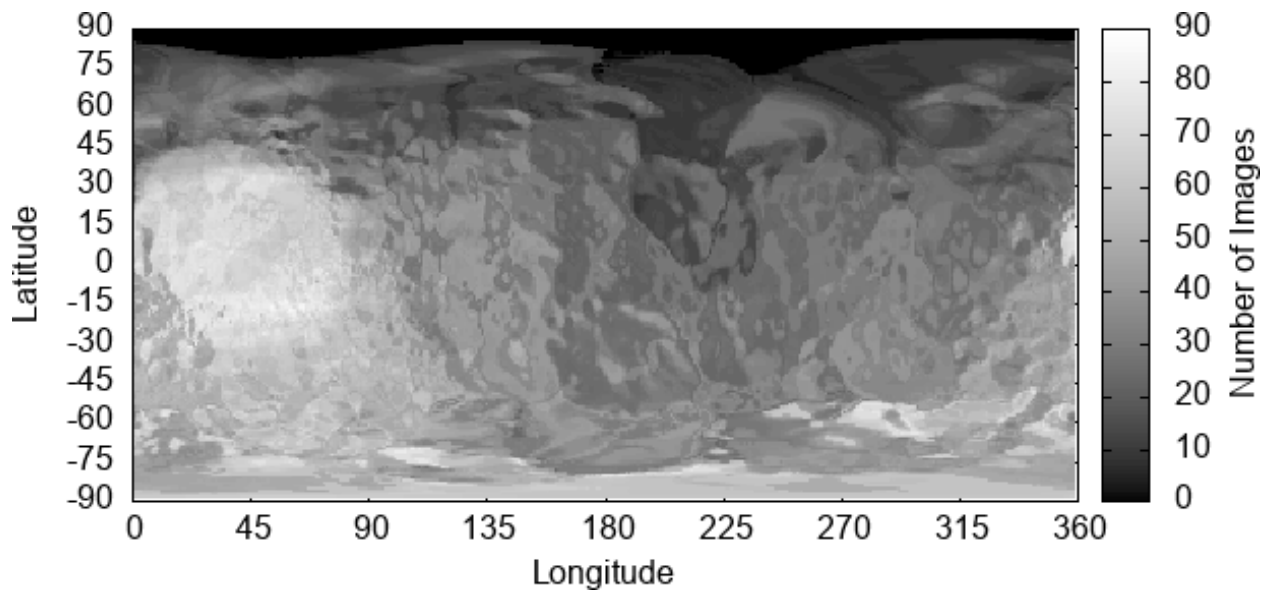
Phoebe

Spacecraft Imaging Campaign

MAXIMUM IMAGE RESOLUTION
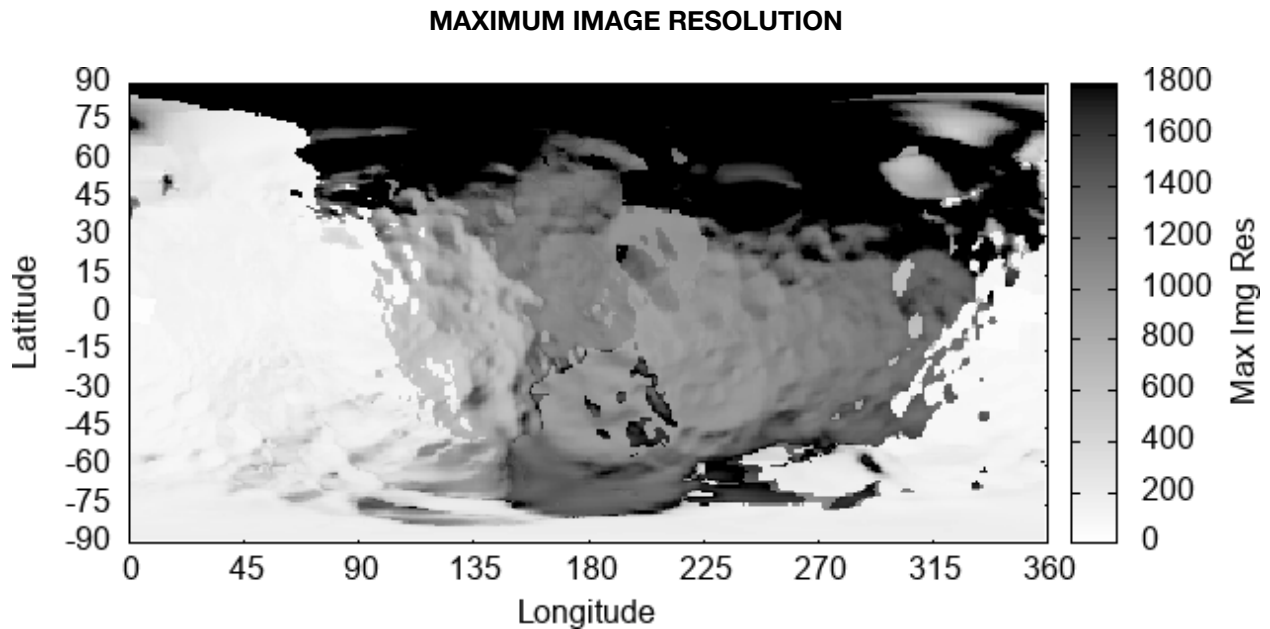
This figure presents the same information as phoebe_maxres_c.cub. The worst image resolution is about 2,800 m/px at the image center, but high emission angles near the edges of images result in portions of the surface having a maximum image resolution up to three times worse. The best image resolution is around 15 m/px. The poorest resolution images are mostly over the North Pole. The best image resolutions are at the South Pole and within ~100 degrees of the prime meridian.
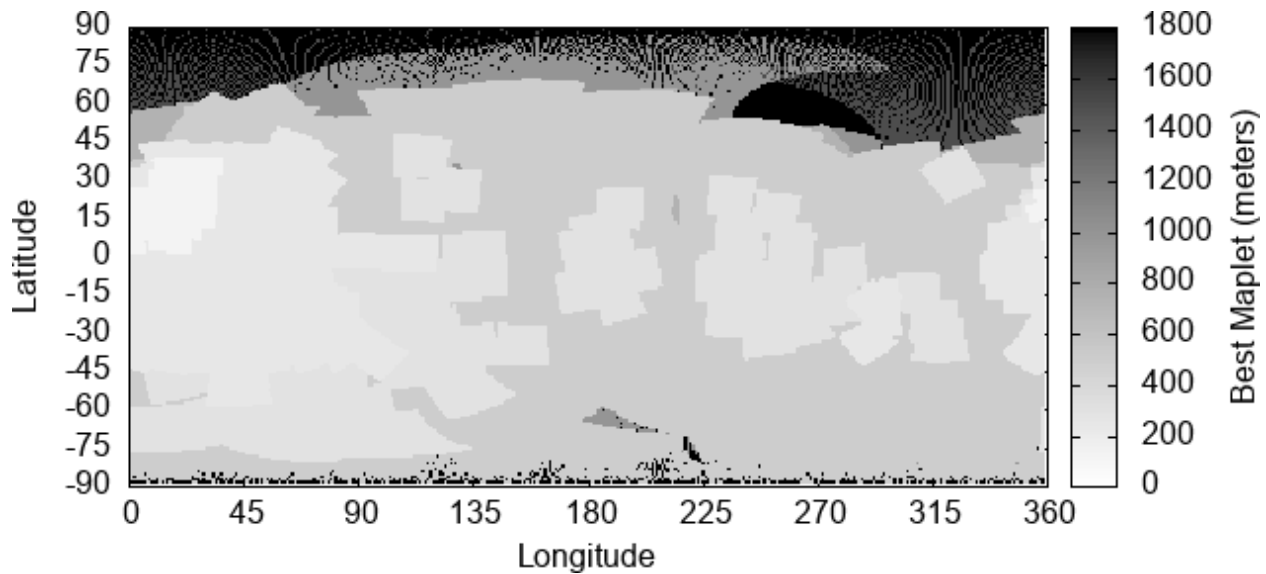
NUMBER OF IMAGES

This figure presents the same information as phoebe_numimg_c.cub. Note that while some portions of the surface have nearly 90 images, many of these images are too low of resolution to construct the highest resolution maplets. The lack of images over the North pole is evident in this figure.

Global DTM Assessment

BEST MAPLET RESOLUTION

This figure presents the same data as phoebe_bestmap_c.cub. Regions near the poles appear "pixelated" because the distance between DTM vertices becomes large at the poles. These "gaps" are not gaps in reality, but are gaps in display only. A semi-triangular region near 270 long 60 lat has no maplets and represents a true gap. The radius at this semi-triangular portion of the model is thus unconstrained. Although there is at least one maplet near the North Pole, portions of that maplet have no image coverage, as one can see in the Number of Images figure. The radius at these portions are also unconstrained.

The best maplet resolution loosely follows the best image resolution. Also note that while the DTM has a sampling distance of 300 m GSD for the Q=512 model, large portions of the surface have maplets with a poorer GSD. For example, the best maplets at 315 long -60 lat have 500 m GSD. This means the Q=512 global DTM is oversampling the data in that region. All areas brighter than the location 315 long -60 lat have a sampling distance of 300 m GSD or better. The Q=128 model, with a 1.195 km GSD, is only oversampling the data in the Northern regions.
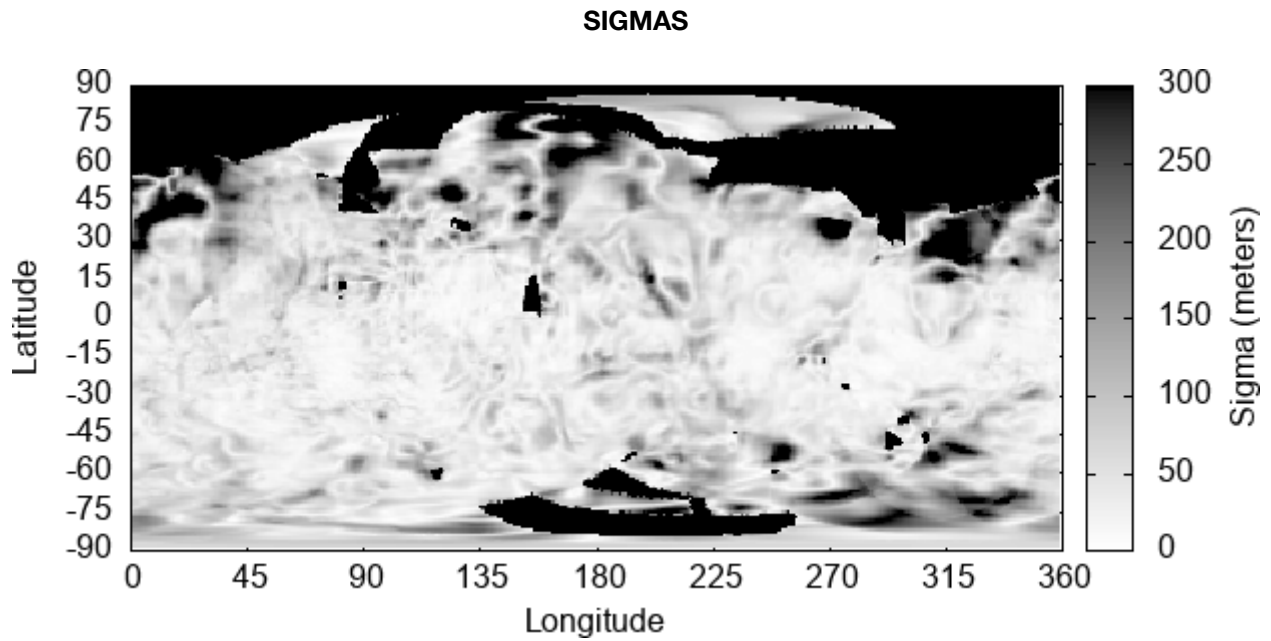
SIGMAS

This figure presents the same data as phoebe_sigmas_c.cub. Many portions of the North Pole do not have a sigma because there is only one maplet at that location. There is also no sigma for two swaths at the South Pole near 200 lon, as well as smaller locations interspersed throughout the body. For portions of the surface with multiple maplets, the sigmas are very good. All portions of the surface have a sigma less than the vertex spacing of the maplets, and in many places it is more than a factor of 3 better. This high level of internal consistency means the accuracy is likely between 1 and 2 times the maplet GSD.

Global DTM Values
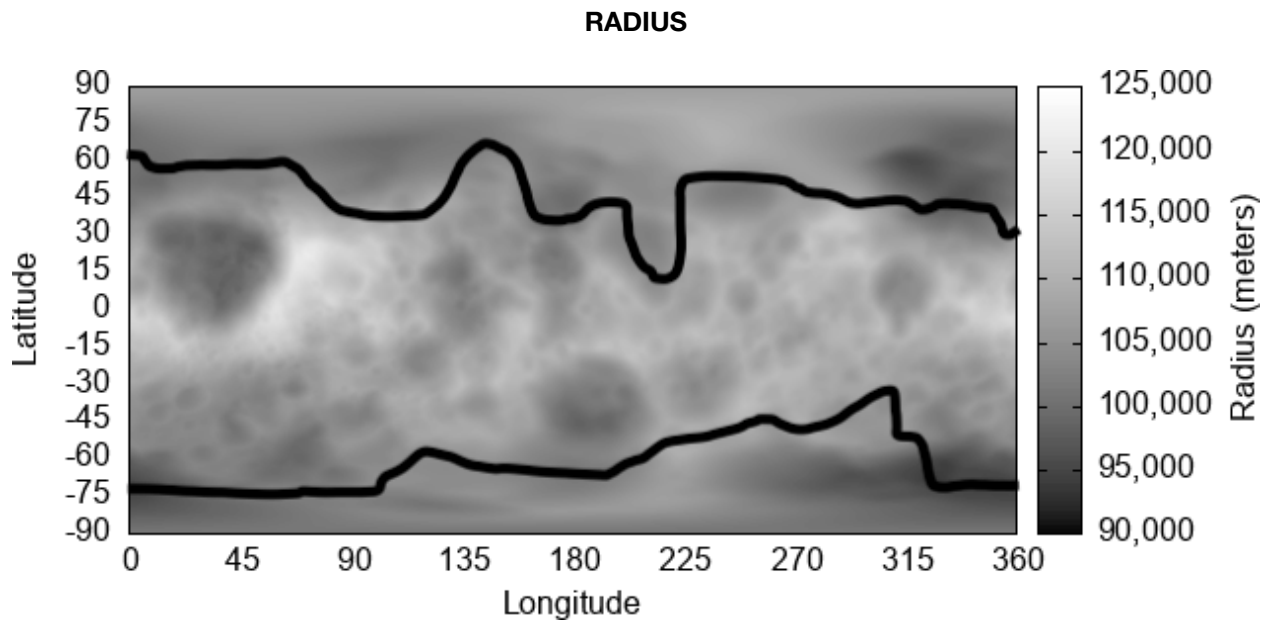
RADIUS

This figure presents the same data as phoebe_radius_c.cub and phoebe_radius_g.tif. Note that portions of the surface have an unconstrained radius (see Best Maplet Resolution). Regions equatorward of the black lines are reliable, while those poleward of the black lines are suspect. See the figures for Number of Images and Best Maplet Resolution for details.
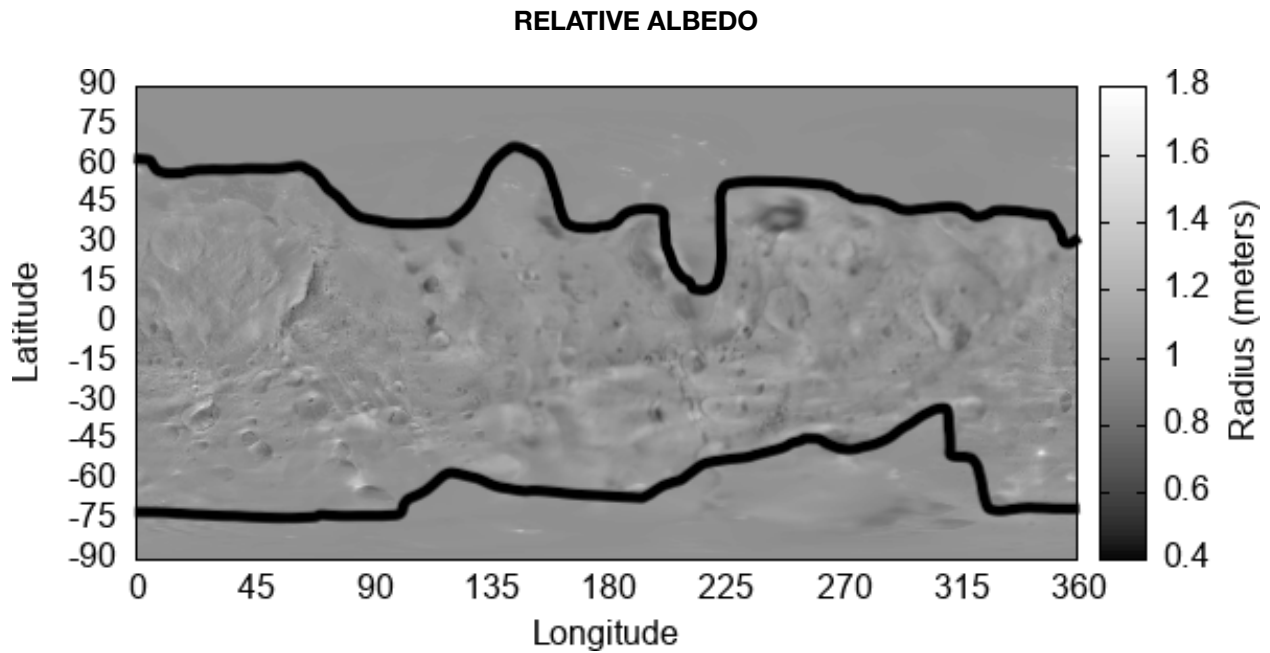
RELATIVE ALBEDO

This figure represents the same data as found in phoebe_albedo_c.cub and phoebe_albedo_g.tif. Note that portions of the surface have an unconstrained relative albedo. Regions equatorward of the black lines are reliable, while those poleward of the black lines are suspect. See the figures for Number of Images and Best Maplet Resolution for details.