Terrain folding artefact observed from DEM extracted from LROC-NAC Stereo imagery

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1 How are the images generated?

DEM generation is done using AMES stereo pipeline and ISIS. NAC images taken by the spacecraft are first processed in ISIS. Raw images taken from orbiter are post processed for calibration and alignment with respect to the lunar map. Steps are

1. **Preparing Raw image data for ISIS processing.**
   (a) **Removal of image artifacts and radiometric corrections.**Program corrects them replacing them with a weighted average of the neighborhood pixels.
   (b) **Removal of image blemishes.** Resolved by taking weighted average of unaffected neighborhood pixels.
   (c) **Camera shading correction.** Occurs due to non-uniform brightness sensitivity across field of view of instrument. Correction of non-identical DN value is done by multiplication and additive corrections.
2. **Geometric processing:** Transformation from image coordinate to map coordinates.
3. **Photometric Normalization:** If the stereo images are of different brightness images then photometric normalization is employed for normalizing the brightness level.
4. **Seam removal and Image mosaicing**
5. **Generate DEM using Ames Stereo Pipeline** to generate Comma Separated Value(.csv) file.
6. **Import DEM to MATLAB and plot** by Delaunay triangulation algorithm.

2 Issues noticed

The DEM seems to be generating a wave like noise during the DEM generation pipeline which we are unable to localize. The following images illustrate the same better. Another view of this folding noticed now in a bigger timescale is as follows.

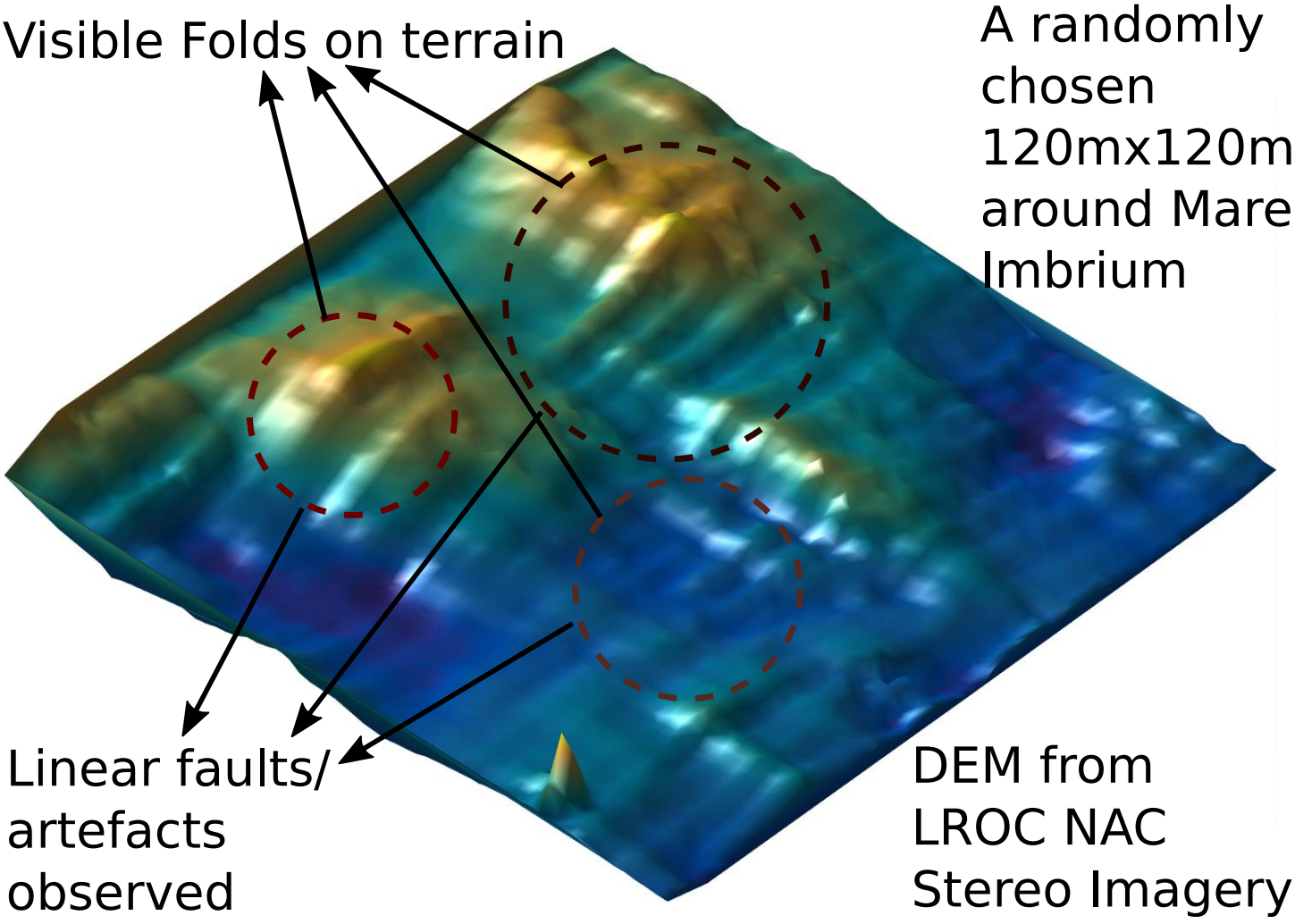

Figure 1: Folding error noticed on a smaller patch randomly selected around expected landing site in Mare Imbrium

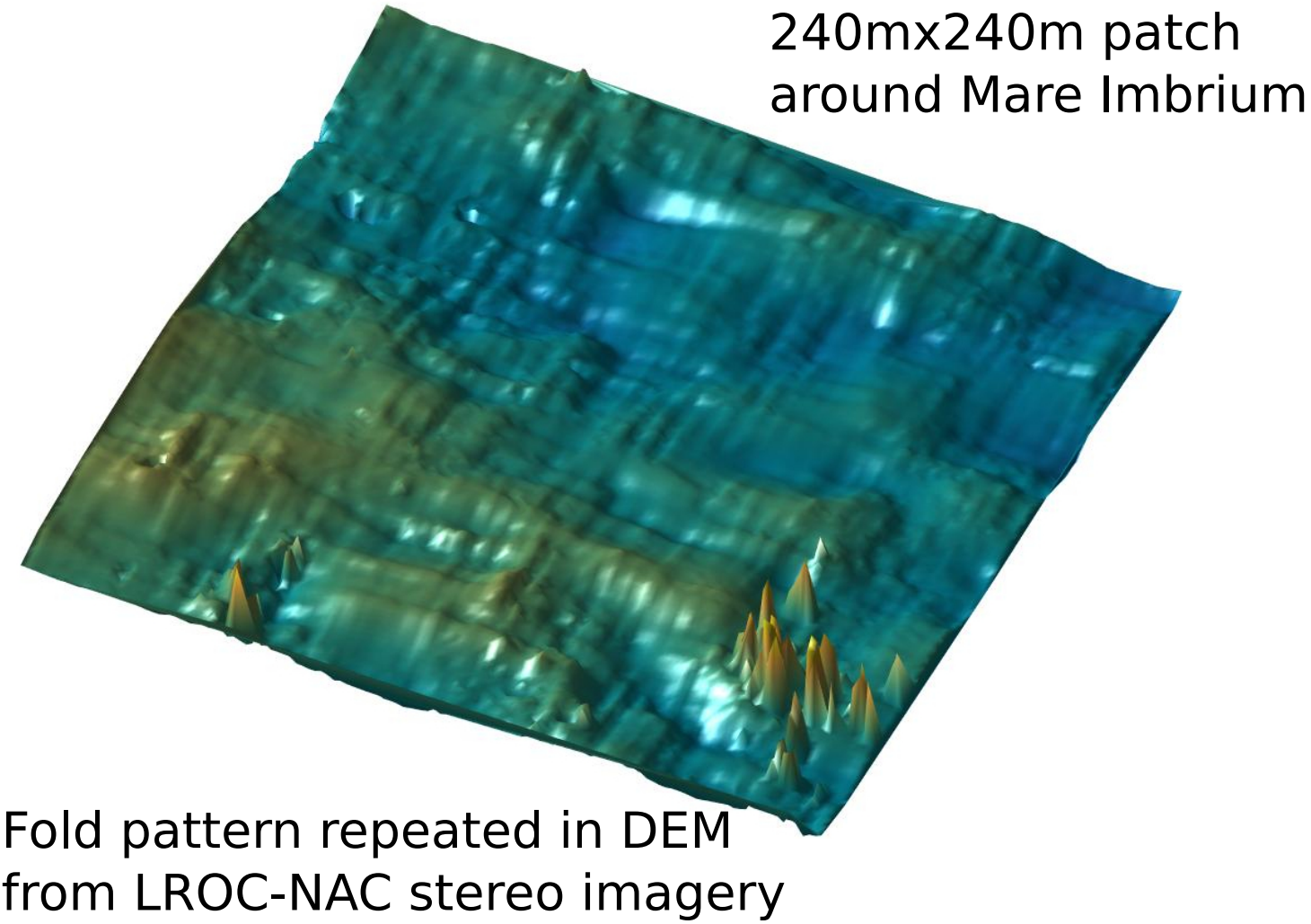

Figure 2: Folding error noticed on a larger patch randomly selected around expected landing site in Mare Imbrium