

Figure legends for image analysis of provisional dome feature M24 Tom Glenn

Figure 1.

Image of the Copernicus region near the sunrise terminator, captured on April 15, 2019 at 05:53UT, from San Diego, CA, using a Celestron C9.25 Edge HD telescope and ZWO ASI183mm camera with a 500nm-575nm bandpass filter. The image was created by stacking 1000 individual frames, and represents a portion of a larger data set. This region of the Moon contains many volcanic domes. The colongitude of the Sun at the time of the image is 34.656. The white box outlines the region of interest for provisional feature M24, and an expanded view of this region is analyzed in Figure 2.

Figure 2.

Analysis of provisional feature M24. **A)** Expanded view of the M24 region from the image in Figure 1. The image has been projected onto the lunar globe using LTVT (lunar terminator visualization tool) to facilitate measurements, and the projection here has been rotated to the point of view of an observer located directly over the feature. The white arrow points to the dome. The central vent is clearly visible, as well as shadows indicating the presence of a dome structure. The elevation of the Sun above the lunar horizon from the vent is approximately 1.5 degrees at the time of this image, as calculated using LTVT. Scale measurements are consistent with an estimated diameter of approximately 18km. **B)** Contour lines drawn using LOLA elevation data in LTVT (LDEM_256, with 256px/degree DEM model). Each contour line corresponds to 50m elevation change. This analysis indicates an elevation difference of slightly over 100m between the rim of the vent and the surrounding lunar terrain in most directions, but with a slightly more gradual change to the south. **C) and D)** The same as **A** and **B**, but using a simulated view generated by LTVT (LDEM_256). This data agrees with the measurements obtained from the telescope image. **E)** High resolution LROC image of the vent of M24, with the magenta line connecting a point on the western rim of the vent with the location on the lunar surface of the dome shadow boundary from the telescope image (coordinates for this point were obtained from LTVT analysis of the image and then loaded into the LROC Quickmap). **F)** Graph showing the elevation change along the magenta line in **E**, indicating a difference of 114m from the maximum and minimum elevations along this path (according to LOLA measurements). This value is consistent with the contour plot generated using the telescope image in **B**. This elevation change occurs over a distance of ~6.5km, which determines the slope to be approximately 1.8%. Scale bars: 10km in **A-D**, 1km in **E**.