Olympus Mons Missing Volume Calculation

Uses input DEM

Olymons centered at 18.42N, 226..83E

DEM average pixel dimension 448.9 m, 201471 m2

Directory location is /home/harold/Downloads/olymons moved to 4\_pmm/olymons\_missvolume

DEM – *OlyMons2* with *olyshade* for display

Surface based upon points selected

* + *surfpts\_1.txt* – 166 points on edifice and outer surface to define pre-missing surface
  + *makesurf.pro* – uses surfpts\_1.txt to generate surface over entire image including areas outside roi
  + note the surface is 3rd degree polynomial – subtract from DEM – *surf\_minus\_dem*

Mask of region of interest to limit area for vol calculation– *volume\_calc\_area*

* + Defined by drawing polygon on the fit surface minus DEM, with its extent guided by the zero contour on this surface
  + Region of interest defines an area of 1325006 pixels

Volume calculation

* + apply the mask to surf\_minus\_dem –> *missing\_volume*
  + calculate volume using *calcvol.pro*

Verification

Added the *missing\_volume* to *OlyMons2* DEM to ensure that surface looked reasonable -

Defined a series of profiles to ensure that surface was reasonable – profiles.png

**Missing area and volume**

Area - 1325006 pixels or **266,950 km2**

Average thickness of missing volume - **2872m**

Volume – **766727 km3**