



New investigations of possible volcanic edifices at the Martian north pole – distribution and characteristics

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The investigation of possible volcanism in the Martian northern polar region could provide new insights into volcano/ice interactions on Mars. Possible small-scale volcanic edifices at the Martian North Pole were described mostly on the basis of Viking images and MOLA topography data (e.g. [1 - 3]). We analyzed distribution and characteristics of these features located between 70°N and 90°N in more detail based on new datasets obtained by the HRSC, THEMIS and MOC instruments. The generally young age of the features as obtained from crater counts on the basis of high-resolution MOC image data suggests recent or even ongoing geologic activity [4]. 140 HRSC images with a resolution between 12 and 200 m/px have been obtained thus far. Many of them were acquired under difficult atmospheric conditions (e.g. dust). Therefore, only 57 of these image strips could be used for this survey. Additionally, we utilized several THEMIS VIS images with resolutions between 20 and 80 m/px. Furthermore, we used gridded digital terrain models from MOLA with a resolution between 128 and 512 px/deg. 526 possible volcanic edifices have been detected thus far. By obtaining several profiles per feature we classified 284 of them as simple cones, 186 as cratered cones and 56 as domes. Additionally, we observed an elongated feature with a positive relief resembling a volcanic dike within the Borealis volcanic field. Work is underway to obtain morphometric attributes such as volumes, heights, average flank slopes, base diameters and crater diameters in order to compare the major edifices with several recently detected smaller features.

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