GEOLOGY OF THE V39 QUADRANGLE: TAUSSIG, VENUS. A. W. Brian[1] and E. R. Stofan[1,2], [1]Planetary Geology Group, Dept. of Geological Sciences, University College London, Gower Street, London, WC1E 6BT, (awb@star.ucl.ac.uk), [2]Jet Propulsion Laboratory, California Institute of Technology, MS 183-501, Pasadena, CA 91109, USA.

Introduction: The Taussig quadrangle (V39) extends from 0°-25°S latitude and from 210°-240° longitude (Fig 1). The region is bounded by Atla Regio to the northwest, Ulfrun Regio to the north, Wawalag Planitia to the south and Hinemoa Planitia to the northeast. It is being mapped at a scale of 1:5,000,000 as part of the NASA Planetary Geologic Mapping Program. Standard photogeologic mapping techniques [e.g., 1,2] are being used to construct a geologic map of V39 using Magellan synthetic aperture radar (SAR) data for the map base. The quadrangle contains 13 impact craters, 2 large volcanoes, 4 paterae, 13 coronae, part of Parga Chasma, and parts of Hinemoa and Wawalag Planitiae. It covers an area of approximately 8.1×10^6 km^2 and varies from 4.3 km above, to 3.6 km below, the mean planetary radius (MPR, 6051.84 km [3]. The impact crater density is 1.6 craters per $10^6 km^2$, which is below the planetary average of 2 per $10^6 km^2$ [4]. The difference is less than ±8, which is not deemed to be significant [5] and therefore the area has a similar average age to that predicted by crater densities for the globe, ~750Ma [6].

Geologic units are mapped using full resolution F-Maps (75 m/pixel), Magellan image data on CD-ROM and synthetic stereo images. Units are defined based on their change in radar backscatter, surface morphology and structure. Unit contacts, in some cases, are found to be distinct and well defined by crosscutting and superposition relationships, but in others are only noticeable through digital manipulation of F-Map data. Additional Magellan data sets used to characterize units are reflectivity, roughness, emissivity and altimetry.

Volcanic Centres: V39 contains many volcanic features from clusters of small shields and volcanic cones to large volcanoes. Mbokumo Mons (9°S, 214°E) has a diameter of 450 km and is 1.1 km high. It has a well defined, radar dark, flow apron that is superposed on the Wawalag plains. Its plateau-like summit is heavily fractured and consequently it has previously been classified as both a corona and a volcano [7, 8]. An unnamed volcano, V (15°S, 215°E), 400 km in diameter, has a similar summit region to Mbokumo with many fractures radiating out from the centre. It sits on a branch of Parga Chasma and has a distinct variable backscatter flow apron. The quadrangle also contains 4 paterae (Ledoux, Villepreux-Power, Fedchenko and Jotuni), which we interpret to be calderas, and part of Ningyo fluctus.

Thirteen coronae are located within the area. Most are associated with Parga Chasma and vary in size up to 400 km in diameter. The largest, Maram (7°S, 221°E), has a tilted, plateau-like interior and is similar in morphology to Atete corona in V40, Zisa corona in V27 and Taranga Corona in V28. Nearly all the coronae have varying amounts of interior and exterior associated volcanism, and appear to have complex histories tightly bound to the formation of Parga Chasma.

Structure: Parga Chasma is characterised by linear features including fractures, graben, normal faults and compressional ridges. It is not a well defined rift system, such as Devona or Juno Chasmata, and displays complex branching networks with several discontinuous offsets along the main system [9]. The linear features along Parga are dominantly graben which range from broad diffuse zones to narrow, highly concentrated, parallel groups. The narrow, more intense zones of fracturing are generally located where the trough is particularly well expressed, and the lineaments tend to correspond well with the topography. Discontinuous troughs, 0.5-2 km deep, are found along the rift. Some ridge features interpreted to be compressional in origin are located within the system. These features are wrinkle ridges, which tend to pre-date the majority of the fracturing and features within the annulae of some coronae.

Stratigraphy: Preliminary mapping has highlighted difficulties in interpreting units associated with areas of chasmata. The high radar backscatter associated with these areas of extensive deformation makes it difficult and sometimes impossible to map continuous unit boundaries and obtain useful stratigraphic information. Many flows within Parga Chasma cannot be constrained to one particular source as multiple phases of deformation have increased the roughness of the unit.

Stratigraphic relationships among units within V39 show a complex and varied history. The formation of many coronae and volcanoes has overlapped in time with that of Parga Chasma. Lava flows within Maram Corona extend up-slope of their source indicating major deformation of the corona interior after their emplacement. Flows from Ledoux Patera embay the rim of Maram and are superposed on some segments of the trough whilst other fractures cut its flow apron. Other coronae in Wawalag Planitia have deformed and disrupted the plains. Although some are significant sources of volcanism, they are not thought to be responsible for the emplacement of the regional plains unit.

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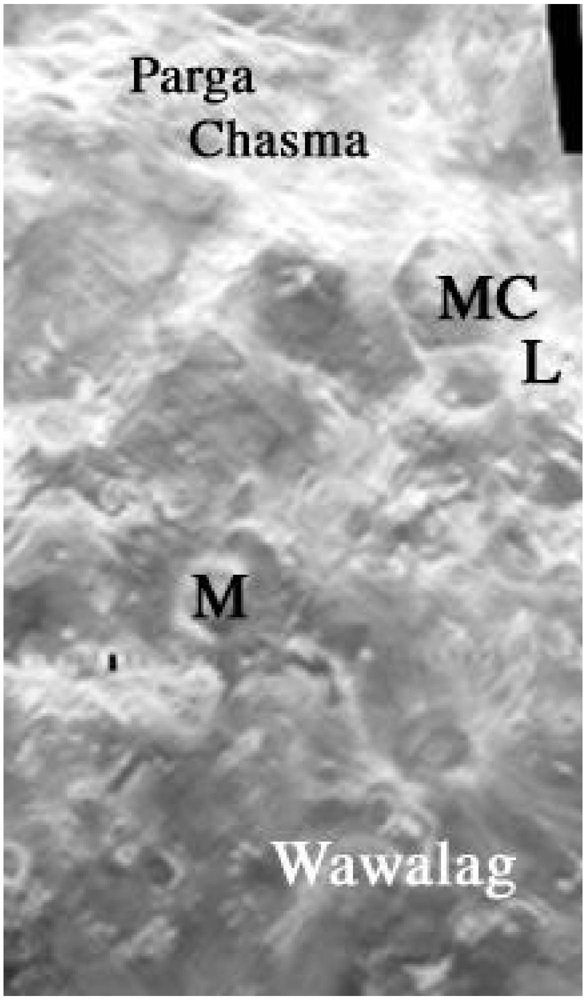
Comparison of this map to other quadrangles such as V28 and V53 will allow us to test recent models of the stratigraphy of Venus [10, 11]. Initial analysis suggests that the region supports a non-directional history for Venus.



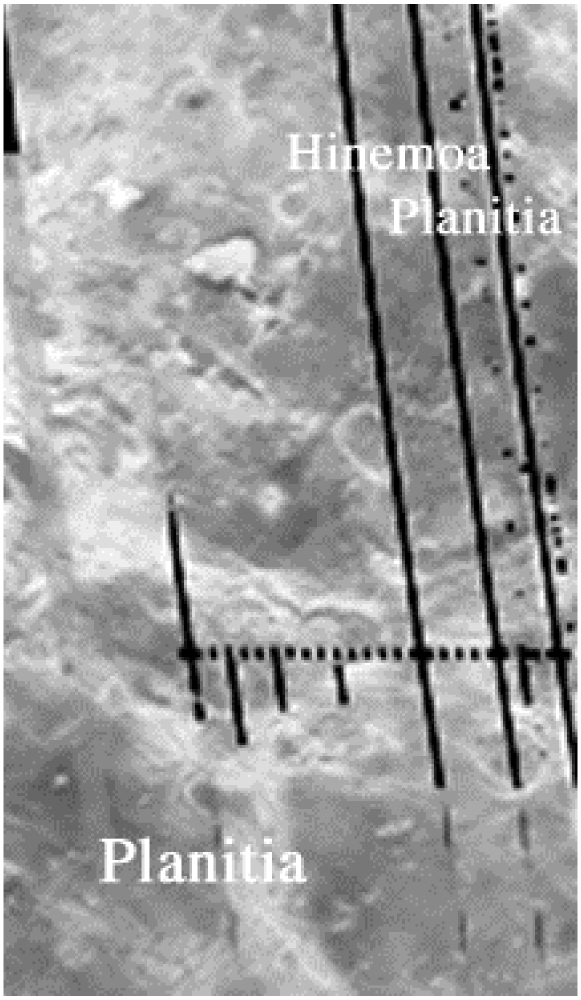


Figure 1 (both images). Magellan image mosaic of the V39 quadrangle, Taussig. Parga Chasma cuts diagonally across the area, separating Wawalag and Hinemoa Planitiae. Maram Corona (MC), Ledoux Patera (L), and Mbokumo Mons (M) are indicated on the image.

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