**GEOLOGICAL MAPPING OF UNNAMED VOLCANIC EVENT (CENTRED AT 0.6°N AND 277.8°E) IN EASTERN PART OF BAT REGION, VENUS.** E. G. Antropova[1], C. H. G. Braga[1], R. E. Ernst[1,2], K. L. Buchan[3] and H. El Bilali[2], [1]Faculty of Geology and Geography, Tomsk State University, Tomsk, Russia; ekatantropova@yandex.ru, [2]Department of Earth Sciences, Carleton University, Ottawa, Canada, [3]273 Fifth Ave., Ottawa, Ontario, Canada.

**Introduction:** Detailed (1:400,000 scale) geological mapping using Magellan SAR Cycle 1 and altimetry data has allowed grouping of several previously independent magmatic features (Table 1) into a single volcanic event more than 400 km across centered on 0.6°N, 277.8°E in the eastern Beta-Atla-Themis (BAT) region, Venus. Preliminary geological mapping in the region was carried out as part of Devana Chasmata (V-29) Quadrangle mapping at a 1:5,000,000 scale by [1].

Geological units were distinguished on the basis of their radar brightness, as well as their relationships with other units. Previously recognized units include an intermediate size volcano, major lava flow fields heading to the east and southwest, and a field of shield volcanoes on the northern side (Table 1).

**Table 1**. Previously catalogued magmatic features in the map area [2], provisionally grouped herein as a single unnamed volcanic event.

| Components of Unnamed Geological Feature | Centre Coordinates | Size or Diameter (km) |
|---|---|---|
| Intermediate volcano (fluted/modified dome) | 0.5°N, 278°E | 20x15 |
| Shield field | 1°N, 275°E (or 277.5°E) | 150 |
| Lava flow field | 1.5°N, 279°E | 250x100 |
| Lava flow field | 0°N, 277°E | 100x100 |

**Detailed mapping:**

*Main volcanic center.* The most prominent topographic feature of the map area is an intermediate size volcano (20x15 km²) (**$C_1$** in Fig. 1) with a maximum elevation of +2650 m. It has been previously classified as a fluted or modified dome (Table 1).

*Lava flow fields.* There are two major lava flows fields in the area (Fig. 1). The first flow field (**fE**) trends downslope in an east or northeasterly direction for ~250 km and includes multiple overlapping individual flows (Figs. 1, 2). The oldest flow unit (**$fE_1$** in Fig. 2) appears to originate from the main volcano (**$C_1$**). The younger **$fE_2$** flow unit appears to be sourced farther north at **$C_2$**. Even younger radar dark flow units (**$fE_3$** and **$fE_4$**) partially cover the earlier flows. Flow unit **$fE_3$** could be sourced from either **$C_1$** or **$C_2$**.

The second flow field (**fSW**) trends in a southwesterly direction for ~100 km, covering older tessera units (Figs. 1, 3). There appear to be local areas of lava breakout [3, 4]. Flow unit **$fSW_1$** may originate from the main volcano (**$C_1$**). Alternatively, a smaller volcano (**$C_3$**) nearby could be its source. **$C_3$** is the source for local radar bright lavas (not shown). The source for flow unit **$fSW_2$** is unknown.

*Shield field.* An intense field of shield volcanoes (**psh**) is mainly concentrated within an area ~150 km across (Figs. 1, 4). However, more widely scattered shield volcanoes are also observed beyond this area (Fig. 4). These volcanoes have gentle slopes and small sizes (5-10 km in diameter), typical of many other Venusian shield fields [5, 6].

**Reconstructed history of combined events:** We suggest that the identified geological units (**fE**, **fSW** and **psh**) are part of a single volcanic event that is linked to the intermediate volcano (**$C_1$**) and nearby sources **$C_2$** and **$C_3$**.

The most tectonically deformed material ("t" on Fig. 4) has higher elevation, is radar bright and is embayed by plains units. This area is interpreted as a tessera remnant. Superimposed on these older units are the flow fields **fE** and **fSW** of the unnamed volcanic event (Figs. 2, 3), the widespread shield field (**psh**), and the "younger flows".

The main volcanic center **$C_1$** fed the flows (**$fE_1$** and **$fSW_1$** and likely **$fSW_2$**). Flows **$fE_2$** and **$fE_3$** were fed from **$C_2$**. The specific sources of other flows and the shield field are unknown.

**Acknowledgments:** Magellan SAR images obtained from https://astrogeology.usgs.gov/search/?pmi-target=venus based on the data from https://pdsimaging.jpl.nasa.gov/volumes/magellan.html#mgnFMAP.

**References:** [1] Tandberg E. R. and Bleamaster L. F. (2010) *LPS XLI*, Abstract #1816. [2] Crumpler L. S. & Aubele J. C. (2000) *In Sigurdsson, H. (ed.), Encyclopedia of Volcanoes. Academic Press*, 727–769. [3] Wilson L. et al. (1993) *LPS XXIV*, Abstract #1765. [4] Parfitt E. A. et al. (1995), *LPS XXVI*, Abstract #1552. [5] Ivanov M. & Head J. W. (2004). *JGR*, 109, E10. [6] Hansen V. L. (2005) *GSA Bulletin*, 117, 808–822.

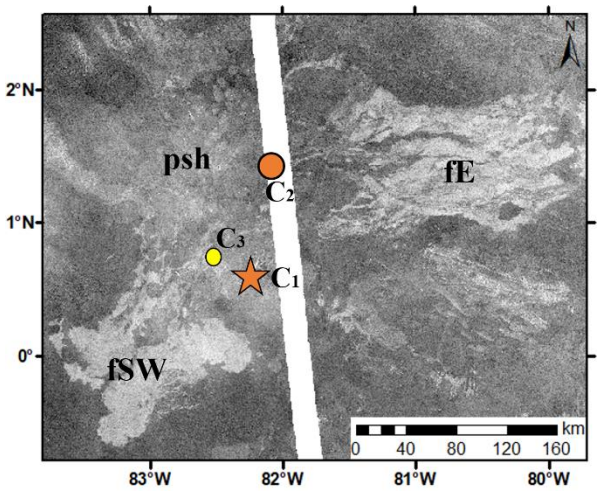


**Figure 1 –** Magellan SAR image of the study area. **C**$_1$ = main volcano; **C**$_2$ = second source; **C**$_3$ = small volcano; **fE** and **fSW** = volcanic flow fields; **psh** = shield field.

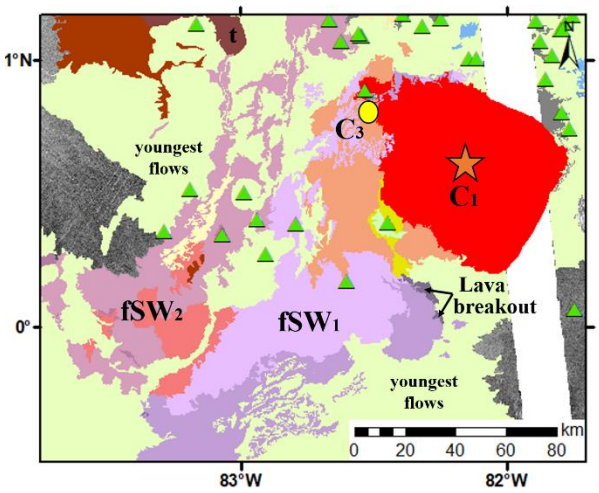


**Figure 3 –** Geological map of the southwest flow field (**fSW**) which is provisionally subdivided into flow units **fSW**$_1$, **fSW**$_2$. **C**$_1$ = main volcano; **C**$_3$ = small volcano; **t** = tessera fragment; triangles = shield volcanoes.

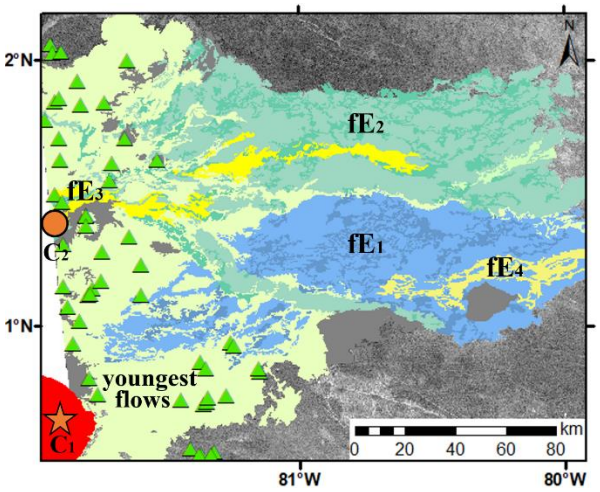


**Figure 2 –** Geological map of the eastern flow field (**fE**) which is subdivided into flow units **fE**$_1$**–fE**$_4$. **C**$_1$ = main volcano; **C**$_2$ = second source; triangles = shield volcanoes.

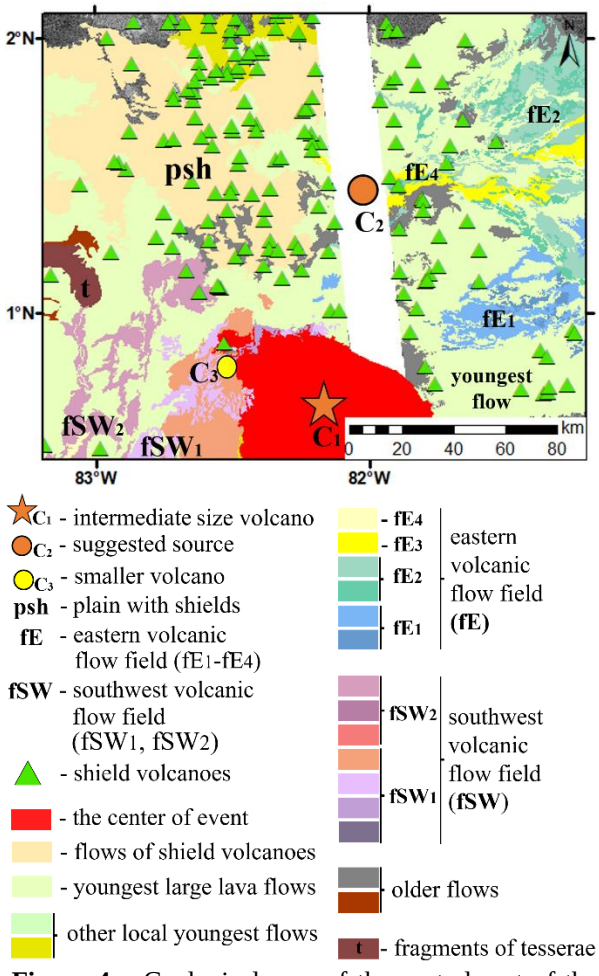


**Figure 4 –** Geological map of the central part of the study area.