INITIAL MAPPING OF THE RUSALKA PLANITIA QUADRANGLE (V25), VENUS. D. A. Young and V. L. Hansen, Department of Geological Sciences, Southern Methodist University, Dallas, TX 75275 (dyoung@mail.smu.edu)

Introduction: Rusalka Planitia is a representative region of Venus's extensive lowlands. Detailed mapping of this area, therefore, can help constrain models of plains evolution. The V25 quadrangle (150 -180 E; 0 -25 N) shows volcanism at all scales, from extensive corona-sourced flows though moderately sized shield volcanoes to small volcanic cones, all of which interact with tectonic elements of the planitia, such as wrinkle ridges, lineaments (presumed fractures), deformation belts and broad scale topography.

Methodology: Initial mapping is being compiled digitally on a 225-meter/pixel image base derived from the FMAP dataset, to which synthetic stereo and Magellan geophysical data has be geographically referenced and linked for easy access. The image data has been reprojected and tiled together to form a single base image; this format allows the high spatial resolution provided by digitizing without the troublesome edge effects that plague mapping on individual framlets. Additional image processing and analysis of the high-resolution FMAP images is carried out with IMAGE SXM freeware.

The mapping philosophy is similar to that employed in the Diana Chasma (V37) quadrangle immediately to the south [1]. For a detailed example of plains mapping in that quadrangle, see [2].

Preliminary results: Although detailed results will require further work, some initial observations can be made (see Figure 1).

Structures: The earliest regional structural suite comprises NE to NNE trending subtle lineaments which 'fan out' from the SW corner of the quadrangle. These lineaments cut both smooth dark plains and shield bearing fracture belts, interact in a complex manner with composite shield/flow plains units and provide microtopographic control on coronal and impact crater flow fronts. The lineaments are highlighted by airburst 'sploches', implying that they may be more pervasive than we have mapped. The lineaments parallel structures that were mapped as fractures in V37 [1,2] and that is the interpretation here.

A network of wrinkle ridges deforms most definable material units (including large coronal outflows) that lie below mean planetary radius. However the margins of some deformed flows are diverted by wrinkle ridges - therefore wrinkle ridges may not represent a single rapid event as has been postulated [3], but could be integrated sum of a long process of deformation. Some wrinkle ridge sets that occur on younger units trend parallel to the aforementioned lineaments, indicating contractional reactivation of the earlier, shallowly buried structures [cf. 2].

Coronae, ridged, fractured, and hybrid deformation belts, and simple topographic arches represent concentrated tectonism. More work needs to be done to correlate and place each of these localities within a regional geologic history.

Volcanism: Two corona associated flows dominate the quadrangle: the Praurime Fluctus group of flows filling the northwest corner of V25 (associated with Ituana Corona), and the Agrimpasa Fluctus group of flows in the south-central area of the map (associated with the coronae of Zaryanitsa Dorsa). Both units are clearly confined by observed regional topography. However, retreating lava 'shorelines' in the Praurime Fluctus group, and topographic arch development within the Agrimpasa Fluctus group flows indicates enhancement of the region's topography occurred during and after emplacement of these units.

Synthetic stereo reveals more subdued corona within the plains spatially and perhaps genetically related to so-called 'shield fields'.

We also find more conventional ~200 km scale shield volcanoes.

Long channels of presumed volcanic origin are common throughout the area, including the final 1000 km of the extraordinary Baltis Valis. This feature has been used as a key temporal marker [4], and this map will test this usage. The presence of channels within both dark plains materials and the Praurime Fluctus flows indicates that channels are not stratigraphically confined.

Impact structures: Seventeen impact craters dot the quadrangle; most have associated fine ejecta halos. In addition, a number of airburst 'sploches' exist. While sometimes highlighting fine structures like lineaments and channels, impact derived dust can obscure volcanic unit contacts, requiring interactive stretching of the image data. Crater scarcity makes them useless for dating units within the context of this map [5].

Conclusions: Reconnaissance mapping in Rusalka Planitia indicates that coronae have played an important role in the resurfacing of the quadrangle. Tectonically, a radiating pattern of lineaments

predates a topographically (but not stratigraphically) confined wrinkle ridge network, consistent with patterns mapped to the south. Topography has been enhanced over the time period recorded by the mapped units.

Note: IMAGE SXM macros used for accessing and processing the map base data are available at:
< www.geology.smu.edu/~tectonics/young.html>

References:

[1] DeShon H. R. and Hansen V. L. (1998) *LPS XXVIII*, #1438, [2] DeShon H. R. et al., (2000) *J. Geophys. Res.*, in press, [3] Basilevsky A. T. (1996) *LPS XXVII*, 9257-9262

[4] Basilevsky A. T. and Head J. W. (1996) *Geophys. Res. Lett. 23*, 1497-1500, [5] Campbell B. A., (1999), *J. Geophys. Res. 104*, 21951-21957

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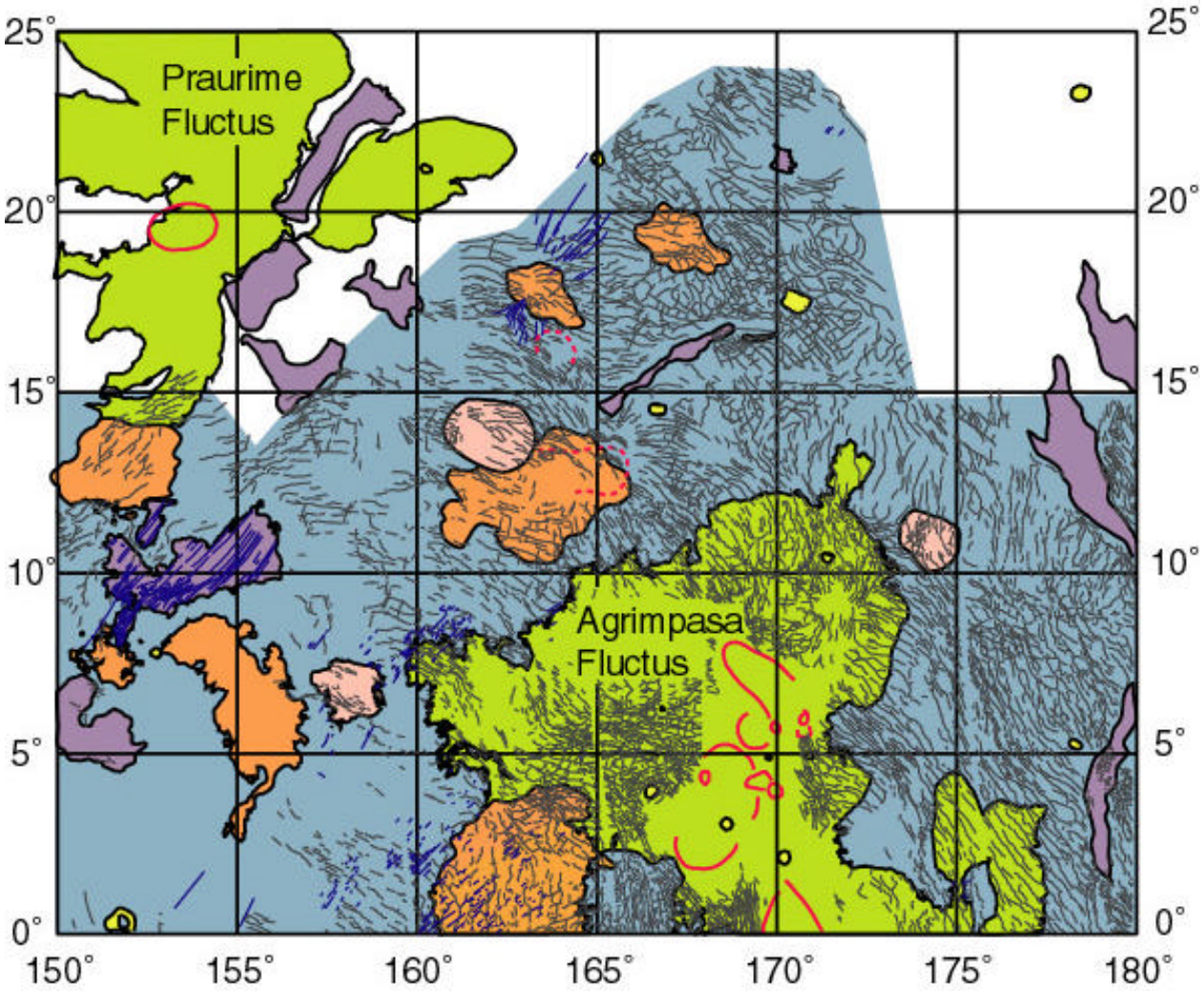

Figure 1: Geologic sketch map of Rusalka Planitia (V25); mapped structures include lineaments (dark blue), wrinkle ridges (gray), and coronae (red); map units include undifferentiated plains (light blue; extent equals extent of current structural mapping), corona associated flows (green, labeled), small shield dominated units (orange), large shield volcanoes (pink), craters (yellow) and lumped 'deformed' terrain (purple). **NOTE: Colours do not imply stratigraphic or temporal correlation!**