

Tectonic Deformation of Sinuous Rilles and Canali on Venus; Jay C. Langdon¹⁾, Goro Komatsu¹⁾, Victor R. Baker¹⁾²⁾. 1) Lunar and Planetary Laboratory, University of Arizona, Tucson, Arizona, 85721. 2) Department of Geosciences, University of Arizona, Tucson, Arizona, 85721.

This is an update of recent research on the longitudinal profiles of sinuous rilles on Venus interpreted from Magellan topography data [1]. Our initial analysis of the known data set of eighty-eight sinuous rilles is complete. We have also examined a greater number of canali than in earlier studies [2].

Canali are longer than sinuous rilles (Fig. 1) and have two observable deformation scales: a longer scale at one or two thousand kilometers and a shorter one at several hundreds of kilometers. All canali (observed to date) are deformed. If the age of sinuous rilles is approximately equal to that of canali, then statistically about 50% should have an uphill trend. But sinuous rilles show a markedly lower degree of deformation than implied by this presupposition (Table 1). Therefore, sinuous rilles did not receive the same degree of deformation as canali and therefore are geologically younger than canali. Canali are considered to have formed in association with a proposed global resurfacing event [3]. Sinuous rilles probably represent volcanism occurring after global resurfacing. This implies that the style of volcanism changed after the global resurfacing event. The newer style of volcanism, which formed sinuous rilles, is more localized, and possibly involves different lava compositions.

Use of a computer simulated fly-over sequence: Though originally intended as a part of a thesis presentation, the fly-over sequence became a very useful tool. As a visual aid to understanding local terrain, once created, our computer simulated fly-over of important channels and other volcanic features was invaluable. This simulation shows some of the prominent tectonic deformations along the channel paths (Fig. 2). This was useful in understanding the emplacement of channels in the surrounding terrain. It has also made for dramatic viewing for the general public.

Acknowledgements: This project has been done in cooperation with the Planetary Image Research Laboratory, Space Imagery Center, and the Center for Computing and Information Technology at the University of Arizona, and the Space Grant Program.

References: [1] Langdon, et. al. (1995) LPSC XXVI 821-822. [2] Komatsu and Baker, (1994), *Icarus*, **110**, 275-286. [3] Strom, R. G. , Schaber, G. G., and Dawson, D. D., JGR, **99**, 10,899-10,926.

TECTONIC DEFORMATION OF SINUOUS RILLES AND CANALI; J. C. Langdon et al.

Catagory	1	2	3	4
Number Occuring	35	13	31	9

Table 1. Sinuous Rille Distribution by Type

Catagory 1. Non-inverted profile

Catagory 2. Inverted profile

Catagory 3. Otherwise unclassifiable due to altimetry and feature mismatches

Catagory 4. Excluded due to various technical problems, ex. no altimetry available.

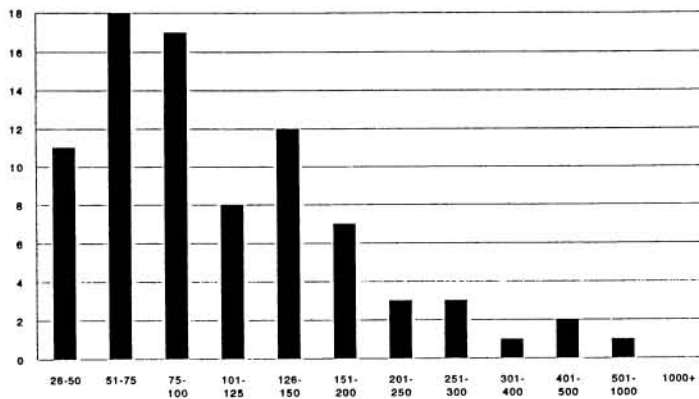


Figure 1. Sinuous Rille Length Distribution

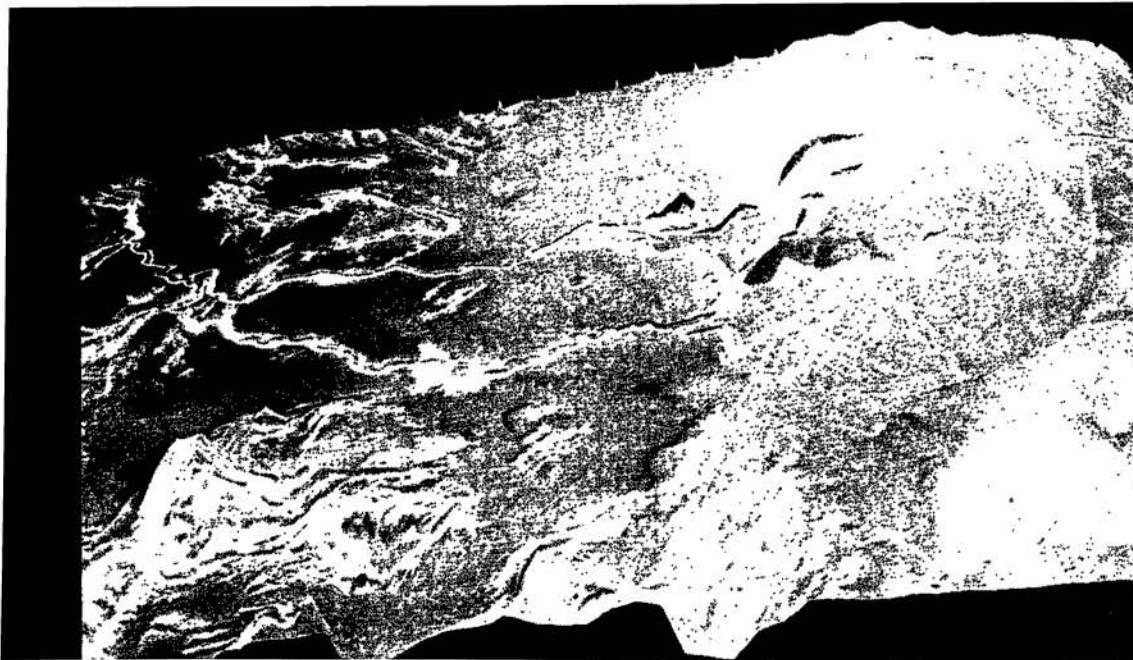


Figure 2. 3D perspective of a sinuous rille cluster and the surrounding region centered around 12S090.