

TENTATIVE ANALYSIS OF REFLECTIVITY MAP OF VENUS SURFACE BASED ON VENERA-15, 16 MEASUREMENTS:
COMPARISON WITH PIONEER VENUS DATA

M.A. Kreslavsky(1,2) and A.T. Basilevsky (2); (1) Astronomical Observatory of Kharkov Univer.
Kharkov 310022 USSR. (2) Vernadsky Institute, USSR Academy of Sci. Moscow 117975 USSR.

A comparison of Venera-15,16 /1/ and Pioneer-Venus /2/ data on Venus surface reflectivity for the area of their overlapping has been made. Fig. 1 and 2 present histograms of reflectivities based on V-15,16 and PV data while the table contains the means $\pm 1\sigma$ for reflectivities of the total area under study as well as for plains and tesserae according to Venera-15,16 photogeologic map /3/.

	VENERA-15,16	PIONEER VENUS
Total area	0.08 ± 0.04	0.12 ± 0.05
Plains	0.08 ± 0.02	0.13 ± 0.04
Tesserae	0.08 ± 0.07	0.11 ± 0.08

The systematic difference between V-15,16 and PV data sets should be probably ignored tentatively because so far V-15,16 data have no good absolute calibration. If the difference exists indeed it may be due to the difference in the wave-lengths used by V-15,16 (8 cm) and PV (17 cm) and the appropriate downward increase of the bedrock/soil ratio. Considering the relative differences and similarities in each of these two data sets it is necessary to take into account that diffuse scattering can be a reason for systematic decrease of reflectivity of rough surfaces such as tesserae /4/. V-15,16 estimations used the "farther" part of the backscattering curve that in the presence of small-scale roughness could lead to overestimation of the reflectivity. The coefficient of correlation of V-15,16 and PV data is no more than 0.5.

Fig. 3 and 4 present in different scales the reflectivity v.s. altitude diagrams. Isolines were drawn through equal logarithmic intervals. The areas with anomalously high (≈ 0.3) reflectivity are localized at altitudes >4 km and -0.5 to 1.5 km (over 6051 km reference sphere). High reflectivity at high altitudes (Maxwell, Akna, Frejya mountains) is confirmed by PV data obtained both in radar and radiometric modes /5/. Some overestimation can be due to high small-scale roughness. Low-altitude areas with high V-15,16 reflectivity are not of high reflectivity on PV map, and may be mostly affected by high small-scale surface roughness.

Fig. 4 shows a correlation of reflectivity and altitude within 3 to 6 km altitude range. The estimations show that this correlation can not be due to uncertainties of the used law of radiowave absorption by atmosphere. The correlation probably reflects a real upward increase of dielectric permeability and, perhaps, microroughness.

- REFERENCES: 1. Abramov A.V. et al., 8 Vernadsky/Brown Microsymposium Abstracts, 7-8, 1988; LPSC-XX, 1989.
2. PV data digital tap, MIT, 1985. 3. Barsukov V.L., Basilevsky A.T. Priroda \pm 6, 24-35, 1986 (in Russian). 4. Bindschadler D.L., Head J.W. Earth, Moon and Planets, 42, 133-149, 1988.
5. Ford P.F., Pettengill G.H. Venus: global surface radio emissivity. Science, 220, 1379-1381 1983.

