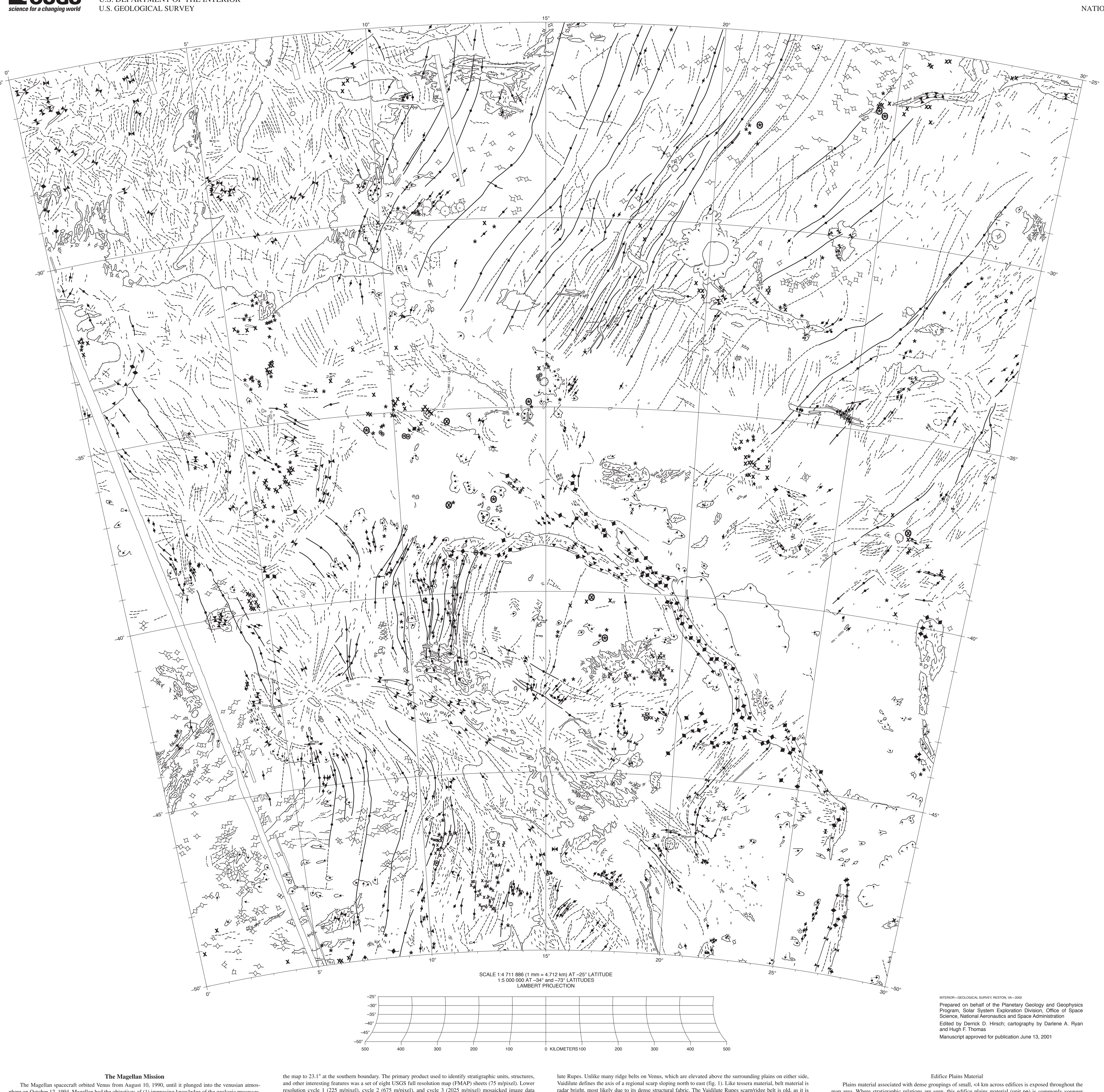
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

Prepared for the
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

GEOLOGIC INVESTIGATIONS SERIES I–2747
ATLAS OF VENUS: KAIWAN FLUCTUS QUADRANGLE (V–44)
SHEET 2 OF 2



Single pits, ~ 0.5–1 km in diameter, in the center of many of these splotches suggest that they are low-relief shields.

Lineated regional plains material also is present in the southeast and south-central parts of the map area. At its boundary with the homogeneous regional plains material, ~100 km south of crater Deborah and south of the western arm of Vaidilute Rupes, lineaments and grabens have the same orientation as those of Brynhild Fossae in the north (fig. 5). The structures change orientation to ~north-south near Selu Corona and Tyche Tessera, where they are apparently strongly influenced by the two local coronae and extension belts (see below). Wrinkle ridges, with an ~east-west trend like that in the north, also are present. The similarity of some of these superposed structures is evidence that both the northern and southern parts of the lineated plains shared some structural deformation episodes. This similarity, together with the similar stratigraphic relationships with other units found in the two areas, argues that both provinces are the same unit. Small, isolated patches of plains in the southern part of the map area that lack these structures are mapped as lineated regional plains material because the radar brightness and textures are similar to those of larger regional lineated plains material patches and because they have equivalent stratigraphic positions. The lineated regional plains material is anomalously radar dark in halos distributed asymmetrically westward from Stuart and Zenobia. Outside of the halos, radar brightness varies from dark, such as near Selu Corona, to close to the Muhleman curve.

dated differently than in the plains, and (3) a few structures actually do cross tessera material. The most heavily tectonized portions of Eve are within the densely ridged plains material. A lower density of structures is within the ridged plains and Carpo and Tamfana Coronae flow materials (in the latter case, many of the regional north-northwest-trending structures are actually associated with the Alpha-Lada belt). Therefore, Eve Corona formation began after the deposition of densely ridged plains material, continued at a slower pace after the deposition of the ridged plains and Carpo and Tamfana Coronae flow materials, and terminated before deposition of relatively young edifice plains material.

Carpo Corona (37.5° S., 3.0° E.) is ~200 km wide and predominately made up of a dense array of radial ridges, grabens, and lineaments. These structures and lineaments are especially concentrated on the eastern and western sides of Carpo. The density of structures is greater than that of any other corona in the map area, making determination of relative ages difficult. Carpo structures cut densely ridged plains material and younger units, including, in some places, digitate and lobate flow material. On the correlation chart, this relation puts the beginning of Carpo evolution at the base of densely ridged plains material, with the end uncertain.

Tamfana Corona (36.3° S., 6.0° E.) is about 300 km across. Its shape, as defined by annular ridges, is approximately circular. A major exception is at the eastern margin, where annular structures abruptly change orientation from north-northeast to northwest. The interior of Tamfana is filled with radar-bright lava flows and

Basilevsky, 1993; Gilmore and others, 1997; Basilevsky and Head, 1998), whereas age estimates for belts relative to adjacent plains are variable (Squyres and others, 1992b; Rosenberg, 1995). Where age relations can be determined, tessera and belt materials are older than surrounding plains in the map area, indicating that the earliest preserved history was one marked by intense strain that deformed pre-existing materials. In the case of tessera material, multiply oriented, superposed structures indicate that this deformation was polyphase, occurring over some interval or divided among several episodes before plains embayment. In contrast, the structures within the Vaidilute Rupes scarp belt are oriented predominantly along the strike of the belt, indicating unidirectional compression associated with the uplift and extension of Astkhik Planum.

Regional-scale uplift appears to have occurred early in the history of the region, uplifting Astkhik Planum as well as Alpha Regio and some tessera inliers. The preservation of plains-embayed tessera margins at these tesserae that dip from the tessera boundaries toward the plains indicate that the later parts of some tessera evolution were characterized by waning uplift and tectonization, consistent with observations of tessera material elsewhere on Venus (Ivanov and Head, 1996; Gilmore and others, 1997).

The subsequent tectonic and volcanic style in the map area changes with stratigraphic age. Tectonism wanes and, in most cases, becomes more localized. The oldest plains generally contain the most structures, as illustrated by the dense arrays of lineaments on the stratigraphically old densely ridged and ridged plains units

TABLE 1. *Map unit radar properties.*

[Radar map properties derived using the Venus Ancillary Data Program [Campbell, 1994]. Unit: Geologic map unit sampled. Location: Descriptive location of sample (for craters, note that interior or flow material is sampled, depending on the unit). Latitude: Measured in degrees, with northernmost latitude first and southernmost latitude second. Longitude: Measured in °E, with westernmost longitude first and easternmost second. Inc.: Radar incidence angle; where two incidence angles are listed for a given location, radar data were available from Cycle 1 left-looking and Cycle 2 right-looking; note that only SAR echo changes as a function of incidence angle. Radius: Mean, minimum, and maximum planetary radius. SAR echo: Mean, minimum, and maximum SAR echo in dB (NA indicates that minimum values were not computed by the Ancillary Data Program and are not available). RMS Slope: RMS meter-scale slope in degrees. Reflectivity: Fresnel reflectivity expressed as the power reflection coefficient. Emiss.: Microwave emissivity. ε_s: Probable extreme dielectric constant for a smooth surface. ε_r: Probable extreme dielectric constant for a rough surface]

Unit	Location	Latitude	Longitude	Inc.	Radius (km)	SAR Echo	RMS	Refl.	Emiss.	ε_s, ε_r
b	middle	−43.08 −43.16	22.27 22.46	26	6051.917	−3.655	5	0.116	0.852	4.2, 5
					6051.68 6052.076	NA −0.123	4.1 5.6	0.1 0.13	0.849 0.856	
b	middle	−43.08 −43.16	22.27 22.46	25		−5.599				
						−18.007 −2.715				
b	north	−38.48 −38.54	15.00 15.22	28	6052.045	−8.495	4.95	0.104	0.867	3.8, 4.6
					6051.86 6052.189	−10.337 −7.205	3.6 5.8	0.085 0.125	0.863 0.871	

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structures of the densely ridged plains material. Ridged plains material does not border tessera-adjacent textured plains material, so their age relationship cannot be determined. Ridged plains material touches edifice plains material, but their relative ages are also equivocal. Therefore, for plains materials exterior to tessera material, densely ridged plains material is the oldest. Ridged plains, edifice plains, and tessera-adjacent textured plains materials are younger than densely ridged plains material and older than all other plains materials, but the age relationship among these three units is not known. The general increase in the density and complexity of structural fabric with age in these plains materials suggests that regional tectonism waned with time.

Belt material (unit b) is distinguished by a densely lineated fabric of ridges and grooves areally confined within long bands at the northern and eastern margins of Astkhik Planum. This belt system is known as Vaidi-

Radar-bright splotches, which are not mapped, are about 15 km across and occur in dense clusters within the northern part of the map area, approximately between the craters St

STRUCTURE/VOLCANO MAP OF THE KAIWAN FLUCTUS QUADRANGLE (V–44), VENUS

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2002