

width. This zone corresponds to the linear topographic depression or central trough in the profiles of Fig. 1b. There are two bright regions: a circular feature in the south about 350 km in diameter corresponds to Theia Mons, and a diffuse but bright area straddling the chasm in the north. The brightest area adjacent to the chasm on the western side corresponds to Rhea Mons. The western por-

tion of the image is characterized by relatively low but variable backscatter and lacks the prominent patterns noted in the central and eastern areas.

The distribution of bright and dark linear features is shown in Fig. 1c. Most are 25 to 100 km long but some range up to several hundred km in length. They are arranged with the long axes parallel to subparallel, trending north to north-

east, and many are arranged in en echelon patterns. The distribution of the linear features is closely related to the central topographic depression. On the basis of these characteristics, the linear features are interpreted to be areas of enhanced roughness, or very steep slopes associated with faults, or both, and this collection of faults related to the central depression are interpreted to be a rift system as suggested previously on the basis of topographic data (11, 14).

The topography and radar image (Fig. 1, a to c) reveals much about the details of the chasma (a central depression) rift system. At the northern end of the image, the rift is approximately 350 km wide and appears to be diverging toward the north into two segments (Fig. 1b, profile A-A'). Over the next 400 to 500 km to the south, the rift zone narrows to 100 to 200 km, and faulting is concentrated in a central depression between Rhea Mons on the western rim and a radar-bright structure on the eastern rim (Fig. 1b profiles B to E). The bright lines interpreted to be faults are closely spaced in this region, averaging 10 to 20 km apart, and they extend for distances of 25 to 150 km along the strike of the valley. At the southern end of this region (profile F) the rift structure widens to 250 km, individual lines become locally more prominent, but the chasma topography is shallow.

Between profile F and Theia Mons, a distance of 500 to 700 km, the topography of the chasma becomes complex. The rift structure (profile G) is wide (250 km) relative to the topographic depression to the north and the depression has a different orientation and appears to be offset slightly toward the east. The change in orientation of the depression (trending more northeasterly) is accompanied by a similar change in orientation of the strike of many of the faults (Figure 1, a to c).

Between profile G and Theia Mons (profiles H and I), two additional depressions are encountered and the rift structure widens to at least 300 km. In the vicinity of Theia Mons, the bright lines are strikingly less abundant, the chasmal topography is obscured, and the positive topography of Theia Mons dominates, suggesting that Theia Mons may be superposed on the chasm and relatively undisturbed by faulting. South of Theia Mons, the rift structure appears to diverge with the eastern arm becoming the prominent Devana Chasma and the western arm extending into the surrounding lowlands. Although there is a wide variation in brightness throughout the chasma region of central Beta (Fig. 1a), nonethe-

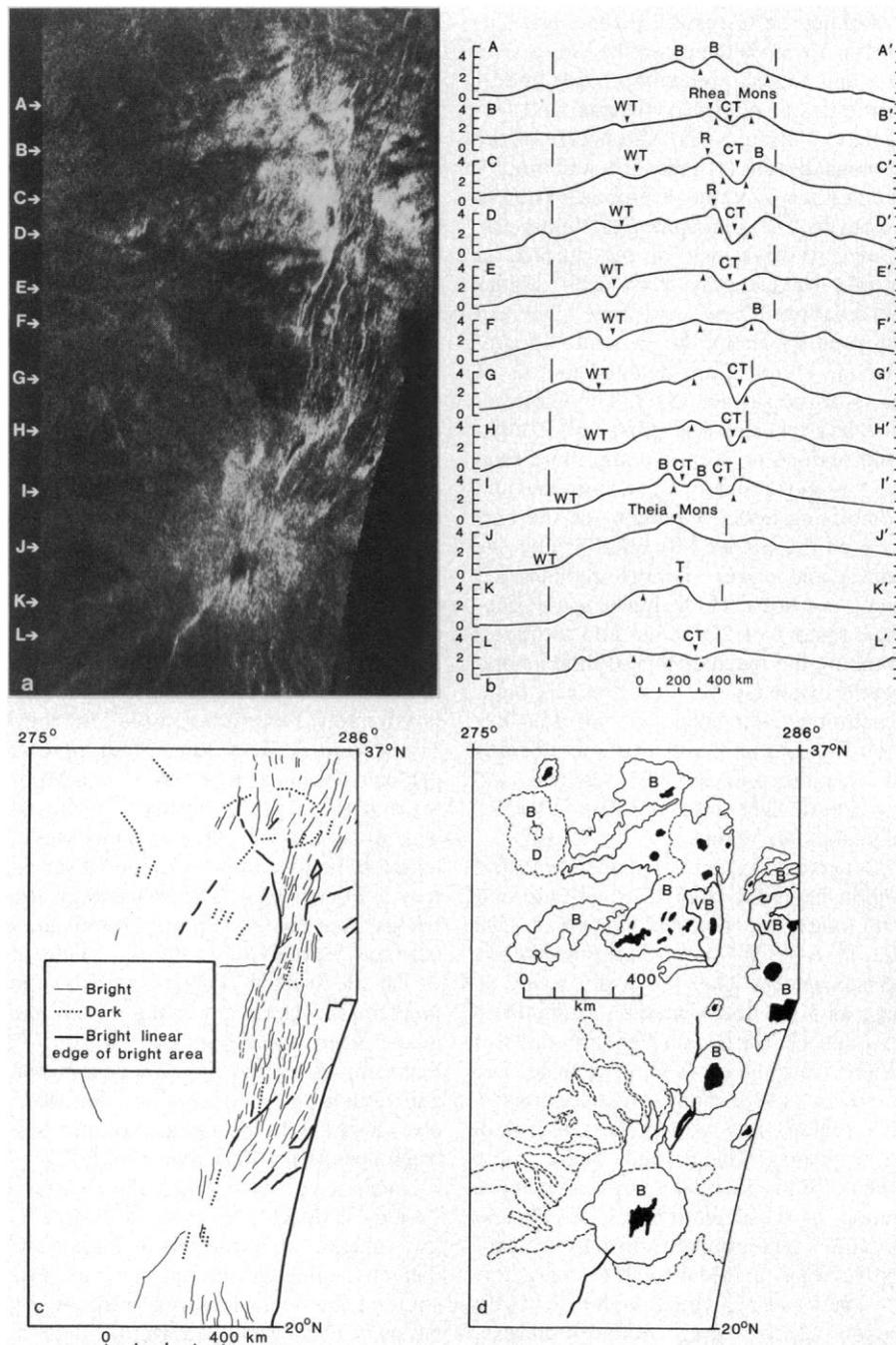


Fig. 1. (a) High resolution radar image of central Beta Regio. Resolution is approximately 2 km (25). Variations in brightness are related to differences in small-scale (wavelength-size) surface roughness values (darkest areas are smoothest and brightest areas are roughest). Letters indicate locations of profiles in (b). (b) Topographic profiles derived from Pioneer-Venus altimetry (14); datum is median radius, 6051.2 km. WT, western trough; CT, central trough; and B, bright area in (a). Vertical lines mark the location of the edge of the image (a). Vertical arrows mark the best estimate of the location of the major bounding faults. (c) Sketch map of bright and dark linear features in radar image. (d) Sketch map of bright areas (B) with central dark regions (black), lobate flowlike features, and a dark area (D) with a central bright region (B).