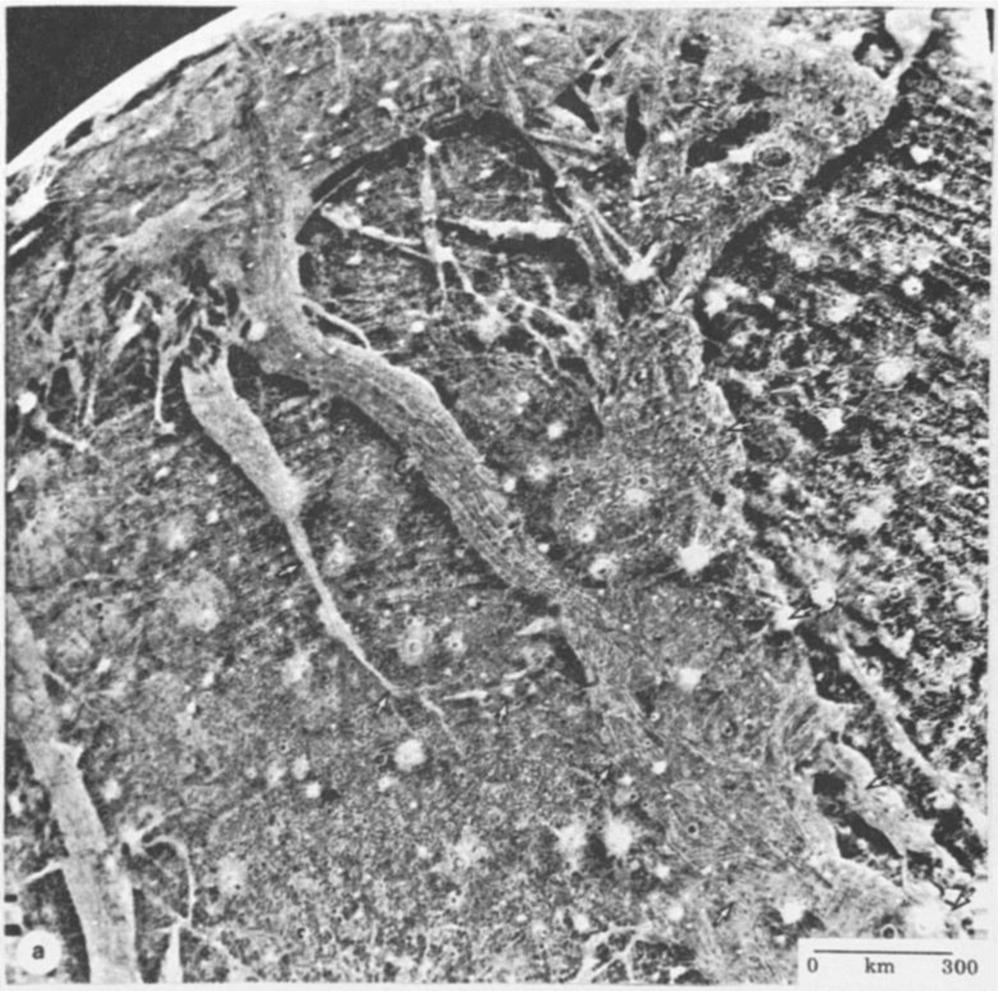


Fig. 2*a*. Arcuate furrows in Galileo Regio and Marius Regio, in the anti-Jovian hemisphere. Note the misalignment of furrow trends between Galileo Regio (at right) and Marius Regio (at left). Area 2, proposed in this study to be a zone of distributed left-lateral shear containing northern Marius Regio and Uruk Sulcus, is at center. Arrows mark the margins of the zone. North is up. (Voyager image 20631.05, centered near 22°N,180°W.)

these maps and reprojected into mercator projections (Figures 4 and 6).

In addition, average trends of 282 conspicuous, linear segments of system I arcuate furrows in six regions of dark terrain (regions "A" through "F" in Figure 7*a*) were digitized for the purpose of furrow pole determination. Five of these regions ("A", "B", "D", "E", and "F") are only minimally disrupted by younger grooves; region "C" contains five smaller dark terrain blocks, each several hundred kilometers in size, separated by narrow bands of light grooved terrain. The furrow segments were selected for digitization on the basis of having a morphology more consistent with that of other furrows than with that of grooves, a criterion similar to that employed by *Schenk and McKinnon* [1987] (W. McKinnon, personal communication, 1987).

For each of the six regions in which furrows were digitized, small circles were fitted to pairs of linear furrow segments more than 250 km apart. The minimum distance was employed to minimize the sampling of furrow curvature controlled by preexisting, subdued, or buried impact structures. The poles of all the small circles so derived were initially averaged separately for regions A-F; the average pole for each region was interpreted to represent the local pole of furrow concentricity. As a measure of the uncertainty of determination of an average furrow pole, an ellipse was fitted along a density contour of the individual small circle poles that encloses 63% of these poles. Both *Zuber and Parmentier* [1984*a*] and *Schenk and McKinnon* [1987] have shown that deviations of furrows from concentricity are approximately normally distributed, so this ellipse approximates a 1.4-sigma uncertainty. Data sets for adjacent regions were combined if the ellipses described above exhibited significant overlap (i.e., were not distinct with 90% confidence); new poles were calculated for the combined dark terrain areas.

This method obviously does not replace the least-squares fit employed by *Schenk and McKinnon* [1987], but rather complements it because a different aspect of furrow geometry is measured. Schenk and McKinnon's method assumes that the furrows follow small circles. This assumption approximates reality in some areas, such as parts of Galileo Regio, but in large parts of central Marius Regio (Figure 4) the furrows are more accurately described as linear segments arranged around a central point. The method used in this study is insensitive to