



Fig. 17. Effects of shear offsets on groove orientations in the (a) anti-Jovian and (b) sub-Jovian hemispheres. Heavy dashed lines are hemispheric scale lineaments. Fine dashed lines are small circles paralleling both the global grooved terrain "structural fabric" and the approximate trends of the proposed shear zones. Capital letters identify groove "superdomains," and rose diagrams show dominant groove orientations within them (adapted from Bianchi *et al.* [1986]). Arc segments outside the diagrams show ranges of system I and III arcuate and radial furrow orientations in the "superdomains" (arcuate only for superdomain "I"). Double-headed arrows show inferred orientations of least principal stress due to shear. The "a" and "b" are the locations of offset groove lanes in Figures 18 and 19. Base material is USGS global airbrush map.

sively within and adjacent to the shear zones, and may have formed as a result of pervasive rotation of 5- to 15-km blocks due to distributed shear. Furrow nonconcentricity not attributable to shear may be the result of minor furrow irregularities, reuse of older system III structures, and perhaps reuse of other, unrecognized preexisting structures.

EVIDENCE FOR RELATIVE MOTIONS OF BLOCKS OF LITHOSPHERE IN THE SUB-JOVIAN HEMISPHERE

Evidence suggesting that shear motions offset dark terrain blocks in the anti-Jovian hemisphere raises the question of similar offsets in the sub-Jovian hemisphere. System III arcuate furrows in the major dark terrain blocks (Barnard Regio, Nicholson Regio) are far from the center of furrow curvature and exhibit

only restricted ranges of orientation, and so are of little use in detecting small shear offsets. Therefore recognition of any shear motion must rely on identification of (1) hemispheric scale structural lineaments consistent in orientation and morphology with shear fault zones, and (2) distinctive features offset across these lineaments.

Hemispheric Scale Structural Lineaments

Four continuous, approximately parallel, hemispheric scale structural lineaments consisting of superposed throughgoing grooves, groove lanes, and linear discontinuities in regional groove orientation were identified in the sub-Jovian hemisphere on the global tectonic map of Murchie and Head [1985] (heavy dashed lines, Figure 17b). Two of the lineaments are close to the continuation of lineament II projected along a small circle, and a third is close to the projected small circle continuation of lineament III (Figure 17). Two of the four lineaments are