

Fig. 4. Rose diagrams for Mariner frames 6N13 and 6N21. The upper half of each rose diagram uses the number of lineations, whereas the lower half illustrates lineations weighted by their length. Lineations ($w3-w2$) recognized as topographic features are to the right; lineations ($w1$) not recognized as topographic features are to the left.

diagram corresponds to lineations weighted according to their apparent length, whereas the upper half represents unweighted lineations.

The rose diagrams from unrectified imagery show several features that result from electronic imaging and subsequent computer processing. The east-west (horizontal) direction is typically devoid of lineations. This is not the result of east-west solar illumination, which commonly does not correspond to the east-west direction of the picture format. It is more likely due to the removal of coherent noise parallel to the direction of tape transport as described by *Rindfleisch et al.* [1971]. The rectified photographs retain this gap in their rose diagrams. The arrows in the data from unrectified imagery (Figure 3a) indicate linear trends identified on unprocessed images. In general, such trends were eliminated effectively during noise removal at JPL.

If the mapped lineations are topographic features, they should be detected most easily where they are perpendicular to the direction

of solar illumination. Such a selection effect in the rose diagrams generally exists for $w3-w2$ lineations. This effect for $w1$ lineations, however, is subordinate to either prominent east-west-trending nontopographic surface lineations or contamination of the data by artificially produced lineations.

After elimination of duplicate lineations in overlapping images, all the $w1$ lineations (total number of 1506) from frames 6N07, 6N13, 6N17, 6N19, 6N21, and 6N23 were combined, and the resulting trends are shown in Figure 5a. Similarly, the combination of 775 $w3-w2$ lineations from the same frames produced the trends shown in Figure 5b. Four of the five trends in the $w3-w2$ lineations have corresponding trends in the $w1$ lineations, and it is thus suggested that some of the mapped $w1$ lineations are surface forms. For comparison, 259 straight-wall segments from the same Mariner

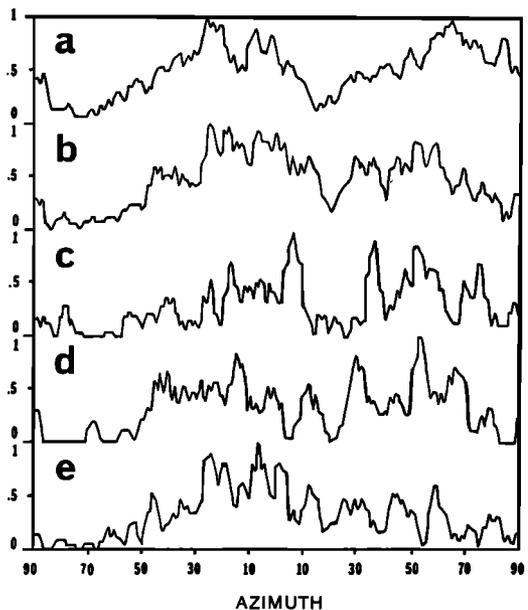


Fig. 5. Frequency-azimuth distributions of (a) 1506 least significant ($w1$) lineations and (b) 775 most significant ($w3-w2$) lineations from rectified Mariner frames 6N09, 6N11, 6N13, 6N17, 6N19, 6N21, and 6N23. Also shown are distributions of (c) 185 $w3-w2$ lineations from Margaritifer Sinus, (d) 219 $w3-w2$ lineations from Meridiani Sinus, and (e) 341 $w3-w2$ lineations from Deucalionis Regio. Lineations have been weighted by their length, and the distributions are normalized to the maximum peak in each data set.