

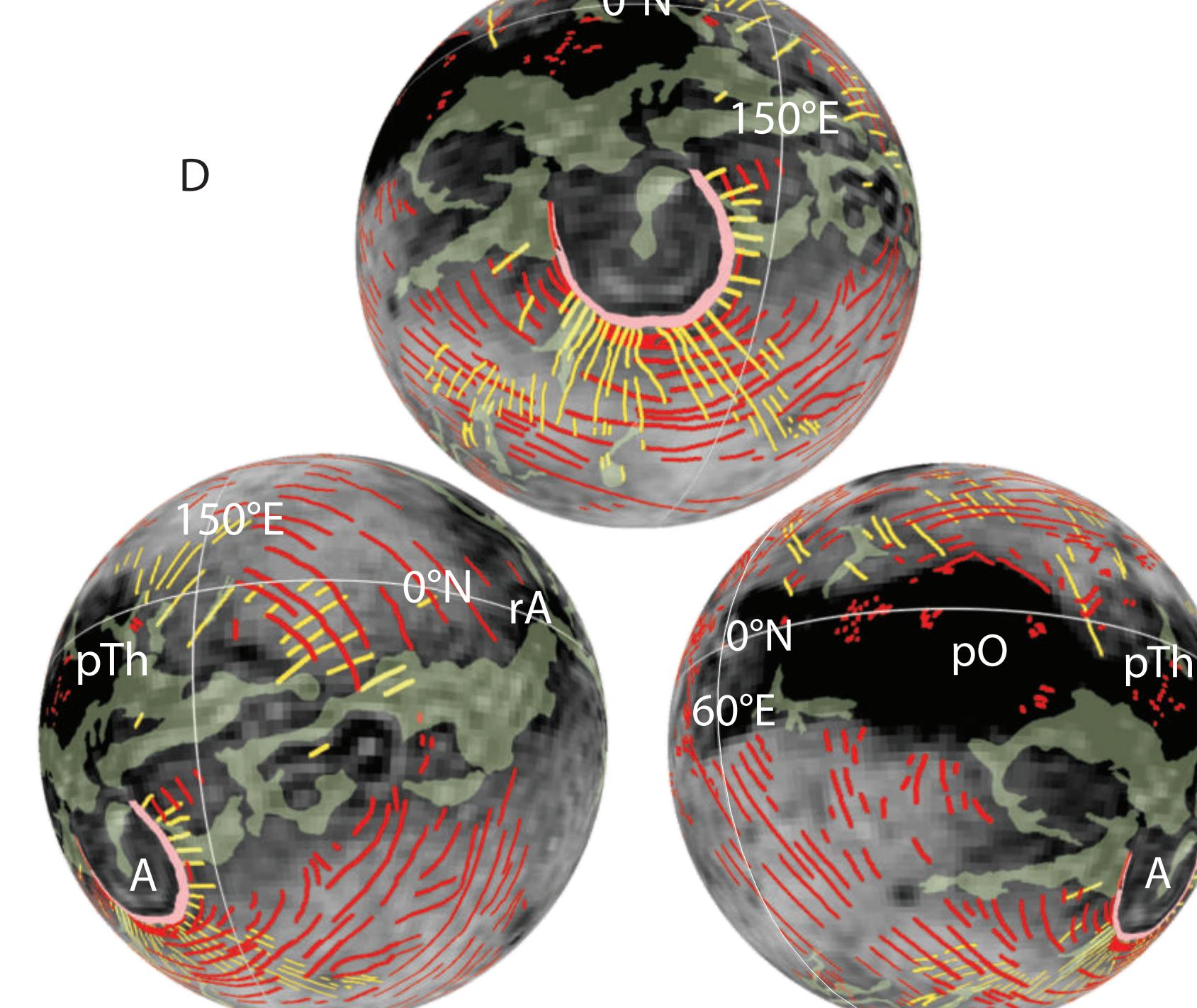
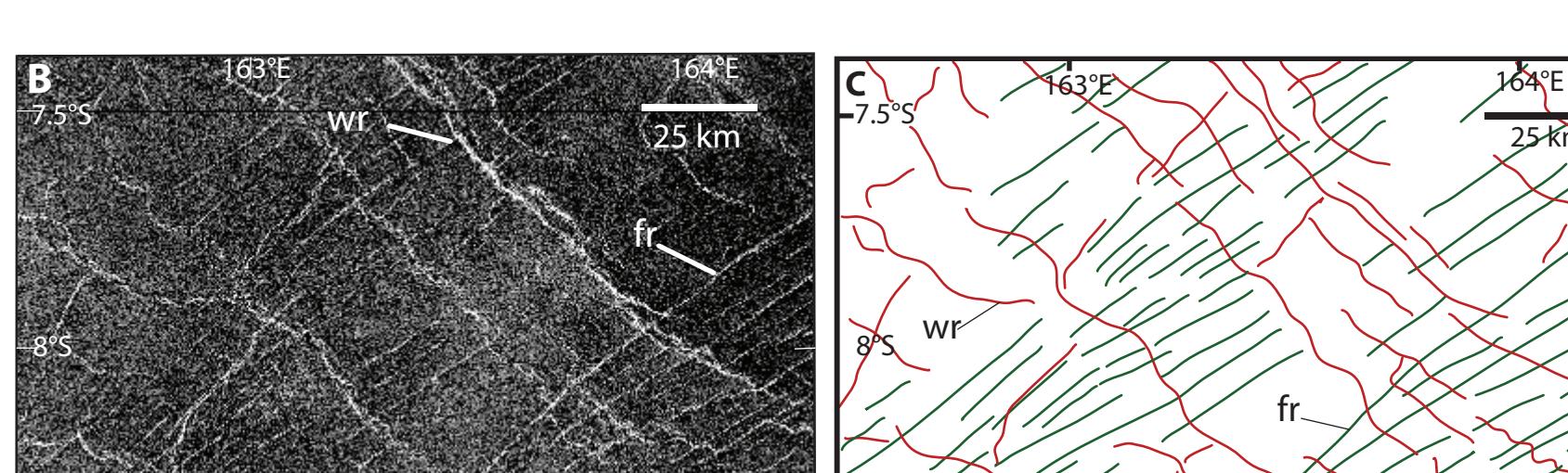
## DRfig1. Hansen &amp; Olive

## Map Key

- Structural interpretations/summaries**
- wrinkle ridge trajectories
  - generalized trends of Artemis -radial fractures
- Secondary Structures**
- wrinkle ridges
  - 'local fracture suites (fractures,fissures, graben); concentric & radial patterns
  - regional fractures (fractures, fissures, graben)
- Units**
- fracture zones (from Price and Suppe, 1995)
  - ribbon tessera terrain (from Hansen and Lopez, 2009)

We are in the process of constructing 1:10M geologic maps of the Niobe and Aphrodite regions (57°N-57°S; 60-180°E) that straddle Aphrodite Terra as part of the NASA-USGS planetary mapping program. We use Adobe Illustrator™ with linked NASA Magellan SAR and altimetry data for mapping, MAPublisher™ to make GIS files, and ArcGIS™ and ArcGlobe™ for compilation and analysis. We mapped local fractures (defining radial or concentric patterns associated with coronae, mons, or volcanoes), regional fractures (elements not obviously part of a local suite, and which lie outside of the fracture zone), and wrinkle ridges (Inset B, C). We refer here collectively to fractures, fissures and graben as 'fractures'. These features form sharp linearities in SAR data; graben and fissures show resolvable troughs, whereas fractures do not. Fractures (including fissures and graben) represent subsurface dikes (Head et al., 1992; McKenzie et al., 1992; Grosfils and Head, 1994; Ernst et al., 2001). Wrinkle ridges, marked by distinctive sinuous ridges, represent modest (<2-5%) distributed surface-layer contraction (Watters, 1992; Mége and Reidel, 2001).

(A) Lineament map of the Niobe-Aphrodite area (Venus) in Mollweide projection with Magellan altimetry base. Wrinkle ridge trends of basin fill in basins at high elevation basin in western Aphrodite are exaggerated for illustration. Thin black polygon marks map area. We include structures derived from several USGS published V-Maps (V-23, Hansen, 2009; V-24 Lang and Hansen, in press 2009; V-25, Young and Hansen, 2003; V-35, Bleamaster and Hansen, 2005; V-37, Hansen and Deshon, 2002; V-45, Hansen and Tharloson, 2009; V-48, Bannister and Hansen, 2009). Outside the Niobe-Aphrodite 1:10M-sheet map area we mapped wrinkle ridges, but not fractures. SAR image (B) and map (C) of fractures (fr) and wrinkle ridges (wr); see DeShon et al. (2000) and Hansen and DeShon (2002) for discussion of temporal relations. E. Grosfils kindly provided wrinkle ridge and fracture data for V13 (25-50°N/180-210°E). (D) Orthographic projections of virtual global views of Artemis, including from the west, from the east, and centered on Artemis; Magellan gravity (low-black; high-light), wrinkle ridges (red) and radial fractures (yellow) trends, fracture zones (green; from Price and Suppe [1995]), and Artemis chasma (pink); pO = Ovda Regio, pTh = Thetis Regio.



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