

## A putative model region for Wilson-cycles on icy satellites: Dione's Wispy Terrain

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Wispy Terrain with its chasmata is one of the enigmatic regions of Dione, one of the icy satellites of Saturn. It consists of quasi-parallel graben, and troughs, in parts with horsts, indicating extensional and shear stresses. This study introduces some observations of compression-related features and proposes a new formation model. The study of the relationship between impact craters and tectonic features revealed the “disappearance” of certain parts of some crosscut, fragmentary craters, indicating additional cryotectonic features, the appearance of accretionary prism-like phenomena (thrust/splay and décollement faults), and theoretically, subsumption-like processes (**Fig. 1**). Hypothetically, it means that Wilson cycle-like tectonic cycles may appear in icy planetary bodies, and Dione's Wispy Terrain, which consists divergent and convergent sections as well, may turn out to be the model region for it. Rifting may be triggered by endogenic (e.g., phase change within the satellite, solid-state convection in the crust, and thermal plumes) and exogenic (e.g., forced libration, tidal forces, orbital forcing, and non-synchronous rotation of the ice shell) processes. This section of the ice crust may spread due to the continuous material accretion via cryovolcanic activity and at a certain geological moment it may collide with thicker, more stable, and possibly older terrain of the crust, e.g., some evolving part of the so-called Faulted Terrain collides the much older Intermediate Cratered Terrain. This study provides new information about the surface renewal processes at one of the youngest and probably still active regions of Dione.

**Figure 1.** Searching for analog processes: the explanation of some fault system and crater relations with the appearance of subsumption on Dione's icy crust.

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