Lobate Scarps

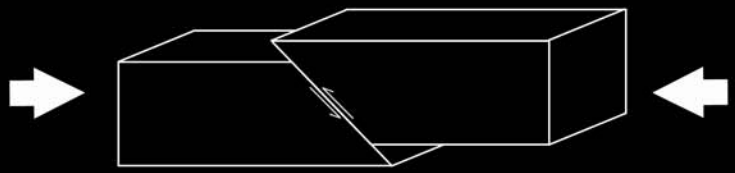
Tectonics: Lobate scarps are the most prominent tectonic features.

Characteristics:

- Distributed globally
- 100's kilometers long
- Up to several kilometers high
- Asymmetric cross-sections
  - steep sloping scarp face and gently sloping back scarp
- Rounded crests
- Sinuous but generally linear to arcuate planforms
- Offset crater floors and walls

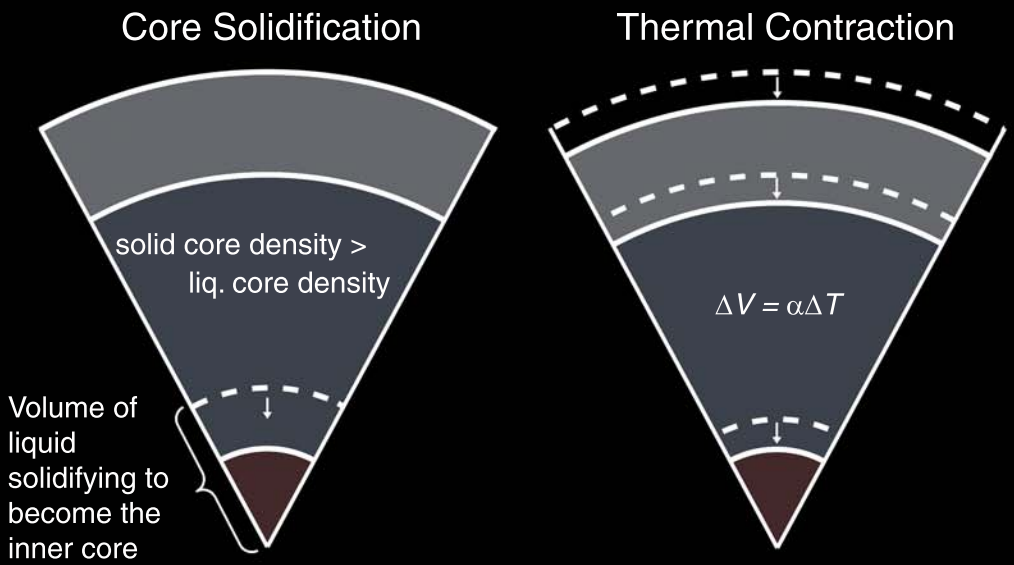
Beagle Rupes (left) and Discovery Rupes (right) (Credit: *NASA/Johns Hopkins University Applied Physics Laboratory/Carnegie Institution of Washington*)

Lobate scarp discovered by MESSENGER during its 2nd flyby (Credit: *NASA/Johns Hopkins University APL/Carnegie Institution of Washington*)



What? Lobate scarps are interpreted to be the surface expression of major thrust faults (compressive features).

When? Scarp formation postdated the intercrater plains, possibly forming after the smooth plains, during the Tolstojan and Calorian Periods.



How? They are generally attributed to global contraction of the planet resulting from a cooling interior. Several kilometers of radial contraction have occurred. Contraction of the planet occurs from (1) thermal contraction of a cooling lithosphere, mantle, and core, and (2) a liquid–solid phase change. As the liquid iron core freezes a solid iron inner core, the more dense solid core has a smaller volume. The estimate of global contraction provides a constraint on models of the thermal evolution of Mercury's interior.