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The role of internal low strength layers on the stability of Venusian domes.

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Over 320 domes have been identified on Magellan images, with more that 80% showing modified morphologies (Bulmer and Guest, 1996). These authors proposed that lateral flank collapse on Venusian domes is the result of localized volatile accumulations and oversteepening during growth.

Studies on the rock mechanical properties and slope stability analysis for rocks under Venusian conditions show a stable behavior and lead to propose that triggering mechanisms as seismic activity could be necessary for slope failure to occur and that presence of ash deposits between basalt layers could help to reduce the resistant force (Roardarmel and Schultz, 1998).

Analogue modeling of oceanic hot-spot and arc shield volcanoes on Earth shows that the presence of internal low-strength layer could produce spreading and lead to desestabilization and collapse (Oehler et al., 2005). Some of the experimental resulting collapse-related morphologies are similar to collapse features observed in Venusian domes (whose morphology and size is equivalent to the volcanoes used in the analogues models).

In this work I compare selected examples of collapsed domes on Venus to the experiments carried out in the analogue modeling and make an initial approximation to the possible nature of low-strength layer in Venusian domes and their relation with mode of emplacement and petrological characteristics.

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