IMPACT SHOCK FEATURES OF THE VARGEÃO DOME, BRAZIL

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The Vargeão dome of western Santa Catarina state, Brazil, is approximately 12 km diameter and exposes shocked pre-Cretaceous quartzose sediments in an uplifted core surrounded by brecciated lowermost Cretaceous Serra Geral basalt flows. Although extensive annealing has occurred in the basalts, relict weak shock effects are preserved in plagioclase. The core rocks, with near-vertical slickenlines, carry multiple shock-deformation lamellae and planar fractures in clastic quartz grains recovered from brecciated conglomerate and sandstone. Planar deformation features (PDF's) in the quartz are typically decorated and somewhat curved. The template method [1] for evaluating Universal Stage measurements of planar deformation features indicates the following orientations: common: {10-11}; less common: (0001), {10-13}, {10-12}; and scarce: {11-21}. The scarcity of diaplectic quartz glass might indicate peak transient shock pressures less than 35 GPa [2]. Progress on X-ray investigations of peak-broadening in naturally shocked quartz and changes in unit-cell dimensions is summarized [3].

References: [1] v. Engelhardt W. and Bertsch W. 1969. Contributions to Mineralogy and Petrology 20: 203-234. [2] Grieve R.A. et al. 1996. Meteoritics and Planetary Science 31: 6-35. [3] Schneider H. and Hornemann U. 1976. Contributions to Mineralogy and Petrology 55: 205-215.