

## Cathodoluminescent and micro-Raman spectroscopic characterization of shocked quartz from Mt. Oikeyama, Central Japan

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Planar Deformation Features (PDFs) and Planar Fractures (PFs) were found from the optical microscope observations in the quartz grains from Mt. Oikeyama (Akaishi Mountains, Central Japan), of which ridge composes a semicircular topographic features suggesting a crater formed by an impact event.

SEM-CL imaging of planar microstructures in the quartz grains reveals dark narrow lines indicating the destruction of its crystal structure, which was induced by shock metamorphism. Furthermore, SEM imaging of hydro-fluoride(HF)-etched sample clears up internal pillaring within glass-filled lamellae. Remarkable characteristics in such images correspond only to PDFs, which are limited to shocked quartz. Micro-Raman spectral features represent the low crystalline state of the planar microdeformations causing reduction of 464cm<sup>-1</sup> Raman peak intensity and broadening of its peak shape. The 2-D Raman imaging of the PDFs shows a stripe pattern suggesting lamination layer comprised of high and low crystalline parts corresponding to the optical image of the PDFs.

These facts unambiguously confirm impact origin of distinguishing planar microstructures, PDFs, in quartz from Mt. Oikeyama.