

EGU21-3856

<https://doi.org/10.5194/egusphere-egu21-3856>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



## Chronology and Element Distribution of Shock-deformed Regions in Zircon from the Chicxulub Impact Structure

**Zhao Jiawei**, Xiao Long, He Qi, and Xiao Zhiyong

State Key Laboratory of Geological Processes and Mineral Resources, Planetary Science Institute, School of Earth Sciences, China University of Geosciences, Wuhan, China (jiawei\_zhao@cug.edu.cn)

Zircon is ubiquitously used to nail down the geological events for both terrestrial and extraterrestrial materials. The U-Pb system and other trace elements in zircon plausibly remain stable and robust in normal metamorphic processes on Earth, while under the extremely shock condition, trace element behaviors in zircon could be unstable and differential due to the generated extraordinary deformations and thermal annealing. Since the systematic deformations in zircon recovered from the Chicxulub impact structure, such as planar fractures (PFs), reidite and granular zircon, the phenomenon of partially or completely age resetting are discovered in zircons from impact melt, breccia, ejecta and meteorites. In effect, element migration during the shock or post-shock setting is the most critical question, which may yield age resetting in nature. The enrichment of elements in shock-deformed zircon regions (PFs and reidite) are revealed, such as Y, Al, Ca, U, Th and Pb. Due to the limitation of resolution and lack of typical shock deformations, the straightforward correlations among deformations, element migration and chronology in zircon by traditional means have not been illustrated clearly so far. Here we systematically analyzed the correlations between shock deformations (from low to high degree: PFs, reidite and granular zircon) and element distribution in zircon by high-resolution Nano-SIMS mapping data. This can be used to interpret the chronology of shock products both from terrestrial and extraterrestrial bodies.