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Advanced Microscopy in the Study of Tracks in Natural and Synthesized Quartz

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This research focuses on the study of tracks in quartz, an abundant mineral in the earth. Both synthesized single crystal quartz and natural quartz samples from deep underground have been studied. We introduced heavy gold ions into the synthesized quartz samples at different irradiation fluences. The samples were then studied using advanced transmission electron microscopy. We have found isolated tracks that have been generated in the surface regions down to several micrometers. For natural quartz samples, we plan to study the microstructure/microchemistry of the crude samples and then image pre-existing tracks and other defects. Further treatments may be performed, such as annealing and ion irradiation, to study the variation in track formation in natural versus synthetic quartz. Other techniques like high- resolution X-ray imaging and atomic force microscopy will also be used for characterizing samples at relatively large volume. Additionally, atomic force microscopy will be used for topological measurements of the tracks. Experimental data will be compared to theoretical models.

Do you plan to give the talk in person?

Co-authors: SUN, Kai (University of Michigan); LAVOIE-INGRAM, Emilie (University of Michigan); SPITZ, Joshua (University of Michigan)

Presenter: SUN, Kai (University of Michigan)