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Effect of atmosphere on fractures as a background in scintillators

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The fractoluminescent properties of BGO (Bi4Ge3O12) scintillators used as particle detectors have been studied in order to quantify the background light generation from fracture. BGO samples in a double-cleavage drilled compression (DCDC) geometry have been stressed to fracture with the crack length and acoustic and light emissions measured in both ambient and vacuum conditions. Using this system, we have been able to identify the light and acoustic output as a fracture propagates. Further experiments should allow for the characterization of these emissions which will aid in the design of particle detectors.

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