UV Enhancement of Etch Parameters of Nuclear Tracks in CR-39\(^1\) NATHAN TRAYNOR, CHRISTOPHER MCLAUCHLIN, KENNETH DODGE, GRAHAM JENSEN, DANTE TUFANO, JAMES G. MCLEAN, STEPHEN J. PADALINO, Department of Physics and Astronomy, State University of New York at Geneseo, Geneseo, NY, MICHELLE BURKE, CRAIG SANGSTER, Laboratory for Laser Energetics, University of Rochester, Rochester, NY — The use of CR-39 plastic as a SSNTD is an effective technique for recovering data in high-energy particle experiments including inertial confinement fusion. To analyze particle track data after irradiation, CR-39 is chemically etched at elevated temperatures with NaOH, producing pits at the nuclear track sites that are measurable by an optical microscope. We have shown that CR-39 exposed to high intensity UV light after nuclear irradiation and before etching exhibits increased ratio of track etch rate to bulk etch rate, also known as sensitivity, as evidenced by increased pit diameter compared to non UV exposed CR-39. Pit enhancement has been seen at wavelengths shorter than 350 nm; wavelengths shorter than 250 nm have not been tested. The enhancement appears to be a result of an increase in the track etch rate, as the bulk etch rate exhibits no dependence on wavelength in the region of interest. Detailed analysis of how this effect depends on the intensity and duration of UV exposure is underway. Further, other factors that can arise during UV exposure, such as increased temperature and production of ozone, may also affect sensitivity and are currently being investigated and mitigated.

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