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UV Enhancement of Etch Parameters of Nuclear Tracks in CR39¹ GRAHAM JENSEN, DANTE TUFANO, GREGORY MARKS, JOSEPH MIFSUD, MARK TEETS, JAMES MCLEAN, Department of Physics and Astronomy, State University of New York at Geneseo, Geneseo, NY 14454, MICHELLE BURKE, CRAIG SANGSTER, Laboratory for Laser Energetics, University of Rochester, Rochester, NY — The use of CR-39 plastic as a nuclear particle track detector is an effective technique for recovering data in high energy particle experiments including inertial confinement nuclear fusion. To analyze particle track data after irradiation, CR-39 is chemically etched at elevated temperatures with Sodium Hydroxide, producing measurable pits at the nuclear track sites. When CR-39 is exposed to ultraviolet light between nuclear irradiation and chemical etch an increase in pit diameter by a factor of as much as 1.7 occurs, due to an enhancement in the track etch rate relative to the bulk etch rate. We have focused specific attention on pinpointing the critical wavelengths which produce this effect: UV below approximately 320nm is effective, and work is proceeding to determine whether the effect ceases at a shorter wavelength. A detailed analysis of how this effect depends on the intensity and duration of ultraviolet exposure is underway. Initial results suggest that this is not simply proportional to UV energy absorbed.

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