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Developing a Webcam-Based Data Logger to Analyze Cosmic Rays in a Cloud Chamber KELLY NEALON, MATT BELLIS, Siena College — Muons from secondary cosmic rays provide students with an opportunity to interact with a natural phenomenon that relies both on special relativity and fairly sophisticated particle physics knowledge. In many physics departments, undergraduate students set up a pair of scintillators in coincidence to measure the rate of these muons and in some cases, measure their angular dependence, but this requires specialized and potentially expensive equipment. We have spent the past year formalizing a design of a cloud chamber that relies not on dry ice, but Peltier thermoelectric coolers, that can be built for about one hundred dollars worth of equipment. With this design we can see the tracks left by cosmic rays, however to turn it into a useful undergraduate physics lab requires some sort of data logger. This poster details our efforts to use an off-the-shelf webcam to trigger on the change in image when a cosmic ray track appears in the chamber. We use this to estimate the rate and angular dependence and compare our results to other measurements. The successes and limitations of this approach will be discussed.

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