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Beyond detection: nuclear physics with a webcam in an educational setting ARTHUR PALLONE, Norwich University — Nuclear physics affects our daily lives in such diverse fields from medicine to art. I believe three obstacles – limited time, lack of subject familiarity and thus comfort on the part of educators, and equipment expense – must be overcome to produce a nuclear-educated populace. Educators regularly use webcams to actively engage students in scientific discovery as evidenced by a literature search for the term webcam paired with topics such as astronomy, biology, and physics. Inspired by YouTube videos that demonstrate alpha particle detection by modified webcams, I searched for examples that go beyond simple detection with only one education-oriented result – the determination of the in-air range of alphas using a modified CCD camera. Custom-built, radiation-hardened CMOS detectors exist in high energy physics and for soft x-ray detection. Commercial CMOS cameras are used for direct imaging in electron microscopy. I demonstrate charged-particle spectrometry with a slightly modified CMOS-based webcam. When used with inexpensive sources of radiation and free software, the webcam charged-particle spectrometer presents educators with a simple, low-cost technique to include nuclear physics in science education.

Arthur Pallone
Norwich University

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