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Online Muon Capture and Decay Experiment[1] MEGAN ALEXANDER, DANIEL MINER, WOJTEK SKULSKI, FRANK WOLFS, Department of Physics and Astronomy, University of Rochester, Rochester NY, 14627 — With the aid of the internet, the classic muon lifetime experiment has been made globally accessible. Our muon detector consists of a 2000 cm^3 plastic scintillator and $2''$ phototube. The muon signals trigger a digital signal processor, which samples the waveform every 25 ns during an 8 microsecond period following the trigger. Signals characteristic of muons that stop and decay in the detector contain two pulses: one from the muon itself, and one from the decay products. The muon lifetime is obtained from the time difference between these pulses. The digitized data are sent to the host computer via a USB link, and fed to a website (http://wolfspc.pas.rochester.edu/muon). The website provides access to the muon waveforms, a lifetime histogram, and energy spectra. Raw data are available for download and can be imported and processed by programs such as Excel or MATLAB. The site allows the user to watch the incoming data in real time, carry out data analysis of a fraction or all of the data collected since November 2005, and explore the underlying particle physics concepts.

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