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The Evergreen State College Cyclotron Project AMANDEEP DHILLON, PAUL LESSARD, CHRIS SMALL, Evergreen State College — We have designed a multipurpose cyclotron device, which may be used to conduct a variety of experiments. We are building our device in stages. Our first stage is a FT-ICR spectrometer, which uses an array of induction coils to monitor orbits in the chamber. We will then take the signal and subject it to the Fourier transform, yielding the cyclotron frequencies of all species orbiting in the chamber. Once we have these frequencies, and amplitudes, we can determine the charge to mass ratio, and relative abundance of our species. This type of spectroscopy can distinguish between species with similar masses. We will then use the radio isotopic dating ladder, which requires higher and higher accuracies, beginning with carbon 14 dating, as a measure of our success. Stage two consists of installing an exit port for the accelerated particle beam. For this we have designed a new extraction method that may better suit our particular application rather than the standard methods. At this stage we will use the signal coming from the induction array to determine the frequency at which we oscillate the potential across the gap. This allows us to synchronize the accelerating voltage and the particles orbit such that we can effectively accelerate particles even when at relativistic speeds.

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