

Abstract Submitted  
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**The Evergreen State College Cyclotron Project** CHRISTOPHER SMALL, AMANDEEP DHILLON, PAUL LESSARD, The Evergreen State College — We have designed a cyclotron device capable of performing a variety of experiments. The first stage in our construction is to make our device useable as a FT-ICR spectrometer. To this end we shall mount an array of induction coils to the floor of the orbit chamber to monitor ions. Applying the Fourier transform to the signal from this array will yield the cyclotron frequencies of all species orbiting in the chamber. From these frequencies, and their corresponding amplitudes, we can determine the charge to mass ratio and relative abundance of species in our sample. We will use the device to perform radio isotopic dating, beginning with carbon 14 dating, as a measure of our device's accuracy. During the second stage we will install an exit port for an accelerated particle beam. We have designed a new beam extraction method that may better suit our particular application than the standard methods. At this stage we will use the signal coming from the induction array to determine the frequency at which we should switch the potential between the cyclotron chamber halves. This allows us to synchronize the accelerating voltage and the particle's orbit in such a way that we can effectively accelerate particles to relativistic speeds.

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