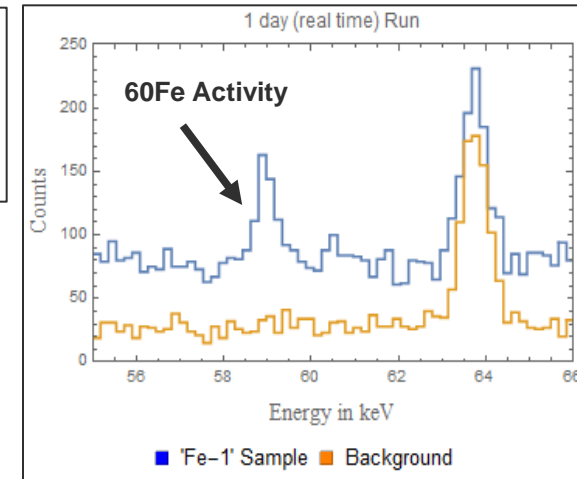
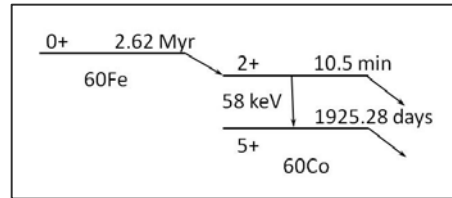


Measurement of the Half-life of ^{60}Fe for Stellar and Early Solar System Models



The radioactive isotope, ^{60}Fe is only naturally produced in massive stars and is ejected into the Universe through supernova explosions and the end stages of AGB stars. Trace amounts of ^{60}Fe has been discovered in Earth's ocean crust, dating back to several millions of years ago. As the half-life of ^{60}Fe is on the order of millions of year, it can be used as a chronometer for past Solar System events.

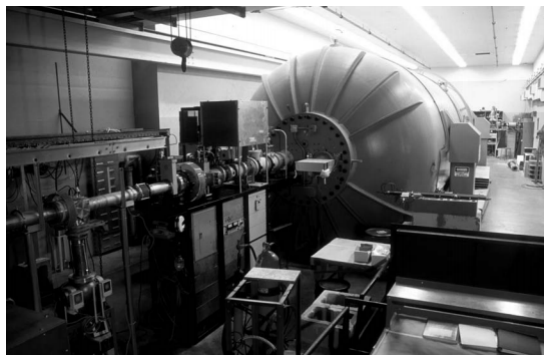


$T_{1/2}$ of ^{60}Fe has been in question in recent years. Work is currently being done at the NSL to confirm it. The work is two-parted: Using Accelerator Mass Spectrometry and Gas-Filled Magnet techniques, the number of ^{60}Fe atoms in a sample can be measured. Together with an activity measurement on the same sample, the half-life can be calculated.

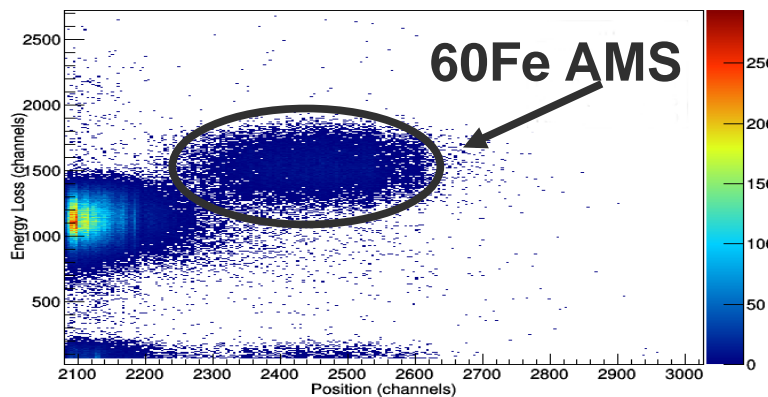
In the following equation, dN/dt is the samples' activity and N is the number of atoms in the sample. λ , is $\ln(2) / t_{1/2}$ where $t_{1/2}$ is the isotope's half-life.

$$-\lambda N = dN/dt$$

During the spring of 2015, the activity measurement was finalized and recently in October 2015, the AMS measurement as been completed. Further work is needed to finalize the half-life.



^{60}Fe Sample "Fe-1", Mass 60



K. Ostdiek, et al. Towards a Measurement of the Half-Life of ^{60}Fe for Stellar and Early Solar System Models. 2015. NIMB

