

Abstract Submitted  
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**Orbital** **Electron**  
**Capture in Extreme Astrophysical Environments**<sup>1</sup> MATTHEW MARTIN,  
KYLE LEACH, Colorado School of Mines — In an attempt to better understand  
the effects of astrophysical environments on the stability of atoms in our universe,  
intense thermal ionization can be investigated based on previous experiments un-  
der terrestrial conditions. Using all known evaluated atomic and nuclear data from  
NIST and Brookhaven National Laboratory (NNDC database), these studies can be  
performed without the need for complex theoretical nuclear structure estimates. By  
accounting for the changing decay energies and loss of electron capture as an acces-  
sible radioactive decay mode, the number of stable isotopes that result in these hot  
astrophysical environments nearly doubles, thus changing the nuclear reaction paths  
for heavy element creation in our universe. This work presents the progress of ma-  
nipulating large amounts of nuclear data to provide precision studies on electroweak  
decay modes under these extreme environments.

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