HAW09-2009-000916

Abstract for an Invited Paper for the HAW09 Meeting of the American Physical Society

## Recent and future rp-process experiments at NSCL

FERNANDO MONTES, National Superconducting Cyclotron Laboratory

X-ray bursts are powered by a sequence of proton capture reactions and  $\beta^+$  decays (rp-process). Although much progress has be obtained, key nuclear physics uncertainties remain. Depending on the astrophysical conditions, the rp- process can extend up to the A $\approx$ 100 mass region. Along the reaction path, even-even N=Z nuclei beyond <sup>56</sup>Ni represent waiting points where abundances acumulate. The half- lives of those isotopes therefore determine the processing time- scale and the final composition once the burst is exhausted. Recent  $\beta$ -decay experiments of N=Z isotopes <sup>84</sup>Mo, <sup>96</sup>Cd, <sup>98</sup>In and <sup>100</sup>Sn will be discussed along with their astrophysical implications. In addition to the half-lives, proton capture reactions constitute important nuclear physics input for our understanding of the rp-processes. The new facility ReA3 will provide opportunities for the study of many of the nuclei involved. Future possible experiments will be discussed.