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Development, commissioning and first experiment of the HabaNERO detector for the measurement of astrophysically important (a,n) reaction rates SHILUN JIN, 1.National Superconducting Cyclotron Laboratory, Michigan State University. 2.JINA-CEE, Michigan State University.3.Institute of Modern Physics,CAS , HABANERO COLLABORATION — Neutron-rich neutrino driven winds in core-collapse supernovae have been proposed as a possible site for the nucleosynthesis of the relatively high Z=38-47 abundances observed in some metal-poor stars. In this scenario, (a,Xn) reactions are the main production mechanism of heavier nuclei once the temperature has decreased in the late phases of the wind. Although it has been shown that the resulting abundances are highly dependent on the rates of these reactions, there is little experimental data for the reactions involved in the nucleosynthesis. The Heavy ion Accelerated Beam induced (Alpha, Neutron) Emission Ratio Observer (HabaNERO) has recently been developed to measure these (a, Xn) reactions of astrophysically interest using the low energy reaccelerated radioactive beams from ReA3 at NSCL, and FRIB in the future. HabaNERO consists of BF3 and ^{3}He gas-filled proportional tubes embedded in a polyethylene matrix and is optimized for neutron detection in the energy range of 0.1-19.5 MeV. Detector design, commissioning at Ohio University, and preliminary results from the measurement of the ^{75}Ga(a,Xn)As cross sections will be presented.

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