

Abstract Submitted  
for the HAW09 Meeting of  
The American Physical Society

**Present status of direct  ${}^4\text{He}({}^{12}\text{C}, {}^{16}\text{O})\gamma$  measurement near stellar energy at KUTL** KUNIHIRO FUJITA, JPS, KENSHI SAGARA, TAKASHI TERANISHI, TAKASHI GOTO, RIE IWABUCHI, SAYAKA MATSUDA, KEIJU NAKANO, NOZOMI OBA, MASAHIKO TANIGUCHI, HIROYUKI YAMAGUCHI  
— A  ${}^{12}\text{C} + {}^4\text{He} \rightarrow {}^{16}\text{O} + \gamma$  reaction plays a very important role in evolution of heavy stars. The cross section is, however, still unknown in spite of more than 40 years experiment in the world because of its quite low value. We are planning to measure the cross section with the direct detection of the produced  ${}^{16}\text{O}$  from  $E_{cm}=2.4$  down to 0.7 MeV by using a pulsed  ${}^{12}\text{C}$  beam and a windowless  ${}^4\text{He}$  gas target. Detection of  ${}^{16}\text{O}$  is the most possible method since detection efficiency of  ${}^{16}\text{O}$  recoils is very high. A new blow-in gas target was developed to achieve  ${}^4\text{He}$  pressure of 24 Torr, and the target thickness along the beam axis was measured by  $p+{}^4\text{He}$  scattering. Using many movable slits installed in a recoil mass separator, backgrounds generated by the  ${}^{12}\text{C}$  beam were eliminated effectively. Present experiment at  $E_{cm}=1.5\text{MeV}$  is reported.

Kunihiro Fujita  
JPS

Date submitted: 01 Jul 2009

Electronic form version 1.4