



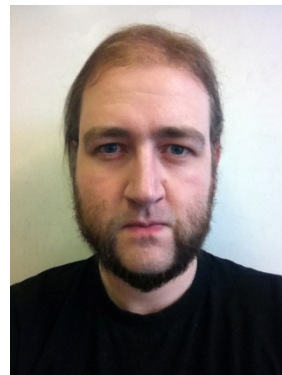
東工大 基礎・物性物理学専攻「物理学リーダーシップ」
FGIP: Foreign Graduate Student Invitation Program
外国人博士課程大学院生の短期招待・共同研究
FGIP-Student Forum セミナー

Adam Tuff (The University of York, UK)

日時: 2012年5月15日(火) 11:00 ~ 12:10

場所: 本館H156

**A Study of Key States in
22Mg Contributing to
Breakout from the Hot-CNO
Cycle in X-ray Bursters**



Abstract: The $^{18}\text{Ne}(\alpha, p)^{21}\text{Na}$ reaction is currently considered a crucial process governing breakout conditions from the Hot-CNO cycle at temperatures of the order of 1GK, leading to energy generation and further nucleosynthesis from the rp-process in X-Ray Bursters (XRBs). Attempts at directly measuring reaction rates in energy regions of interest have been met with difficulty, including the requirement for high beam currents. Many properties of the states such as spin-parities and energies of the compound nucleus ^{22}Mg remain unknown or still have an uncertainty associated with them. Reaction rates at energies in the astrophysical region of interest still carry a large uncertainty due to this, with previous measurements largely in disagreement.

A recently developed technique in radioactive nuclear physics allows study of compound nuclear systems through scattering of a heavy ion beam on a light target to overcome lifetime issues of short-lived reactants. By utilising a radioactive ^{21}Na beam and scattering protons from a hydrogen-rich target, it is possible to study the properties of the states of the compound nucleus ^{22}Mg above the alpha-particle reaction threshold of ^{18}Ne .

This presentation will describe the experiment performed at TRIUMF (Tri-University Meson Facility), carried out to deduce state properties. The data collected using the BAMBINO and TIGRESS (TRIUMF-ISAC Gamma-Ray Escape Suppressed Spectrometer) detectors will be presented, along with observed resonances and their parameters, branching ratios for the deexcitation to the ground state and excited states in ^{21}Na and angular distributions used to extract state properties. Effects on reaction rates in this astrophysical scenario will also be shown.

教員、修士課程大学院生の参加も歓迎します。 担当 中村 隆司 (内線2652)

FGIP-Guest student の滞在スケジュール

名前	大学	滞在期間	受入担当氏名
Adam Tuff	The University of York (イギリス)	5/3-5/19	田中隆己