MO-POS-96

Preliminary Results of the FINUDA Experiment at DAFNE*, **George Beer for the FINUDA Collaboration**, *University of Victoria* — The FINUDA experiment studies the formation and decay of hypernuclei produced by stopping kaons through the reaction $K^-_{stop} + {}^AZ \rightarrow {}^A_\Lambda Z + \pi^-$ FINUDA is a large acceptance spectrometer with resolution below 1 MeV which measures energy levels of the hypernuclei and the particles produced by hypernuclear weak decay. Approximately 250 pb^{-1} integrated luminosity has been collected in 2003-2004. We present preliminary results concerning detector calibration, spectrometer performance, and hypernuclear formation and decay spectra.

* This work is being supported by Art Olin.

MO-POS-97

Measurement of the Parity Violating Asymmetry in Radiative Neutron-Proton Capture*, **Chad Gillis**, *University of Manitoba* — The NPDGamma experiment [1] will measure the parity-violating gamma-ray asymmetry A_γ in the reaction $\vec{n} + p \rightarrow d + \gamma$ in order to provide a theoretically clean measurement of the pion-nucleon weak coupling constant f_π to high precision. The Los Alamos Neutron Science Centre provides a pulsed cold neutron beam which is then polarized by transmission through polarized ^{3}He and captured in a liquid para-hydrogen target. The 2.2 MeV gamma rays from the capture reaction are detected in an array of CsI(Tl) scintillators which are read out in current mode by vacuum photodiodes. The pulsed nature of the beam provides a crucial capability to distinguish systematic error contributions through their unique time-of-flight dependences. The apparatus is being commissioned during the spring of 2004; initial results from the commissioning data will be discussed.

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MO-POS-98

WITHDRAWN

Design Optimization of TIGRESS using a GEANT4 Simulation, **Michael Schumaker,** *University of Guelph* — The TRIUMF-ISAC Gamma-Ray Escape-Suppressed Spectrometer (TIGRESS) will be an important experimental facility for the ISAC-II particle accelerator at TRIUMF. It will consist of twelve Compton-suppressed High-Purity Germanium (HPGe) detectors. A number of design optimization studies were conducted using a software simulation of the TIGRESS array. These studies were carried out using a Monte-Carlo simulation created using the GEANT4 toolkit. The goal of these studies was the improvement of the expected absolute gamma ray efficiency and peak-to-total ratio, and the reduction of experimental error due to Doppler-broadening. In this presentation, I will discuss the results of these simulations, and show how these results have been incorporated into the TIGRESS detector design.

MO-POS-99

Effects of the Symmetry Energy in the Mid-Rapidity Zone*, **René Roy** and the Heavy-Ion Collision Dynamics Research Team, *Université Laval* — The density dependence of the symmetry term of the equation of state (EOS) is a major point of interest in the heavy-ion dynamics. Using a soft Skyrme-like parametrisation, different symmetry terms are tested in the BUU calculations framework. These terms are constant, linear and quadratic with different compressibility moduli. Their effects are observed in the mid-rapidity zone. The chosen observable is the global N/Z ratio of this zone.

* This work is being supported by CRSNG.

MO-POS-100

Detection Prototype with Position Sensitive Photomultiplier / Prototype de détection avec photomultiplicateur à position*, **R. Roy**, *Groupe de recherche en physique des ions lourds, Université Laval* — In the case of heavy-ion collisions physics, the reaction studies must be supported by a good detection matrix with good mass, charge, energy and position resolutions. For this we need a good set of photomultipliers. Then I have choosen to study a position sensitive photomultiplier, which gives great gain and compactness, to improve position resolution. It is giving good results in position, up to 1mm of position resolution. Also, it can be coupled with a large set of different form scintillators, giving unlike resolutions. *Dans le cadre de la physique des collisions d'ions lourds, l'étude des reactions doit être soutenue par une bonne matrice de detection, possédant de bonnes résolutions en masse, charge, énergie et position. Pour cela, nous avons besoin d'un montage adéquat de photomultiplicateurs. Le choix d'utiliser un photomultiplicateur à position, ici, viendra améliorer la résolution en position. Il possède un grand gain et il est intéressant pour son aspect très compact. Les résultats obtenus parlent par eux-mêmes ; j'ai obtenu des résolutions en position allant jusqu'à 1 mm. Il peut aussi être couplé avec des scintillateurs de différentes tailles et formes, donnant évidemment des résolutions propres à chacun des couplages.*

* This work is being supported by CRSNG.

MO-POS-101

Agreement in Supernova Simulations with Boltzmann Neutrino Transport and its Connection to Nuclear Input Physics, **Matthias Liebendoerfer**, *CITA, University of Toronto* — Three independent supernova groups have built detailed Boltzmann neutrino transport into spherically symmetric supernova simulations [1,2,3]. In large scale computations, the energy- and angle-dependent distribution functions for the three neutrino flavors are determined during stellar core collapse and post-bounce evolution. The results of the general relativistic Boltzmann solver, Agile-Boltztran, are compared [4,5] with those of alternative codes that either use approximations for the general relativistic effects or rely on the multi-group flux-limited diffusion approximation for the neutrino transport. The finding that spherically symmetric supernova models with standard input physics do not lead to explosions has settled in qualitative and quantitative agreement. Not so in the dynamically more comprehensive multi-dimensional simulations: they still produce controversial results, as many of them have to rely on severe simplifications in the neutrino treatment. The accurate knowledge of the energy-resolved neutrino abundances throughout the star is a prerequisit to accurately evaluate and improve the underlying nuclear input physics. I point to the dominant reactions and where current supernova models would be most sensitive to changes in the input physics. Some reactions (*e.g.* electron capture rates on nuclei) are crucial for core collapse while others (*e.g.* neutrino opacities in hot dissociated matter) may determine the delay and success for the neutrino-driven ejection of the surface layers. The collapse of the inner core and the ejection of the surface layers should be regarded as distinctive physical events.

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4. Liebendoerfer, Rampp, Janka & Mezzacappa, astro-ph/0310662
5. Liebendoerfer, Messer, Mezzacappa, Bruenn, Cardall & Thielemann, *ApJS*, **150**, 263 (2004)