importance of exchange diagram contributions is demonstrated.

Reference: H. Liang, N. Van Giai, J. Meng, Phys. Rev. Lett. 101, 122502 (2008).

HK 67.62 Th 14:00 Audi-Max

Nonperturbative renormalization group for many fermion systems: from cold atoms to hadron matter — •Boris Krippa — University of manchester, manchester, m13 9pl

The application of the nonperturbative renormalisation group to many-fermion systems with a short-range attractive force is studied. Assuming an ansatz for the effective action with fermions and effective bosons, describing pairing effects, a set of approximate flow equations for the effective coupling including boson and fermion loop contribution has been derived. The phase transition to a state with broken symmetry is found at a critical value of the running scale. Both BEC and BCS regimes as well as crossover between them are identified and studied. The known mean-field results in both regimes are recovered if boson-loop effects are omitted. The developed approach is applied to the variety of many fermion systems such as nuclear/neutron/quark matter and cold fermionic atoms.

HK 67.63 Th 14:00 Audi-Max

Coulomb dissociation reactions on Mo isotopes for astrophysial applications — •Olga Ershova for the LAND-S287-S295-Collaboration — Institut für Kernphysik, Johann Wolfgang Goethe-Universität Frankfurt am Main, Frankfurt a. M., Germany

Photo-dissociation reactions are important for explaining abundances of the nuclei produced via the so-called p-process, which takes place in Type II supernova explosions. Theoretical calculations of the isotopic p-nuclei abundances require a huge reaction network linking thousands of isotopes, where most of the reaction rates have to be derived from theory. However, it's important that as many rates as possible are measured experimentally to provide pivot points for the calculations. In all present models, a significant underproduction of Mo and Ru p-nuclides is observed. At the same time, ^{92}Mo has one of the highest cosmic abundances of all p-nuclei.

At the SIS/FRS/LAND facility at GSI (γ,n) reactions on the stable ^{92,94,100}Mo and the unstable ^{93}Mo isotopes were studied. The experiment was performed in inverse kinematics using the Coulomb dissociation method. The setup provides a possibility to identify the outgoing nucleus with respect to A and Z. Together with a neutron hit in the LAND detector, it allows to tag the proper reaction channel. Gamma-rays emitted by the de-exciting nucleus were measured with the 2π CsI gamma spectrometer. Current status of the analysis, with a focus on the gamma detection, will be presented.

This project is supported by the HGF Young Investigators Project VH-NG-327.

HK 67.64 Th 14:00 Audi-Max

The ^{15}N(p,γ)^{16}O reaction studied at LUNA — •Daniel Bemmerer for the LUNA-Collaboration — Forschungszentrum Dresden-Rossendorf (FZD), Dresden, Germany

The ^{15}N(p,γ)^{16}O reaction lies at the intersection of the first and second CNO cycle of hydrogen burning. Recent R-matrix extrapolations suggest that its cross section may be lower by about a factor two with respect to previous work. Here we show new, direct experimental data on this reaction obtained at the LUNA 400 kV accelerator deep underground in the Gran Sasso laboratory in Italy.

HK 67.65 Th 14:00 Audi-Max

α-decay half-lives for neutral atoms and bare nuclei — •F. Farinon for the E073-Collaboration — GSI Helmholtzzentrum für Schwerionenforschung GmbH, Darmstadt, Germany — Justus-Liebig-Universität, Gießen, Germany

The influence of the bound electron cloud on the α-decay constant λ has been discussed theoretically since the late 50s. Precise Q-values and α-decay half-lives of fully stripped ions are important to obtain an unambiguous determination of the electron screening energy, thereby deducing reliable reaction rates in stellar environments. Recently, the measurements of α-decay half-lives are feasible also for highly-charged radioactive nuclides. Using a ^{238}U beam at relativistic energies at the present FRS-ESR facility at GSI it is possible to produce, efficiently separate and store highly charged α-emitters. Few candidates have been selected for the proposed investigations and will be studied by using the Schottky Mass Spectrometry technique. In order to establish a solid reference data set, lifetime measurements of the corresponding neutral atoms have been performed directly at the FRS by implanting the separated ions into an active silicon stopper. These results will be reported.

HK 67.66 Th 14:00 Audi-Max

Simulation und Entwicklung eines Monitordetektors zur Messung der Intensität der fensterlosen Tritiumquelle am KATRIN-Experiment — •Detlef Maurel für die KATRIN-Kollaboration — Universität Karlsruhe (TH), Institut für experimentelle Kernphysik

Ziel des Karlsruher Tritium-Neutrinoexperimentes (KATRIN) ist die direkte und modellunabhängige Bestimmung der Neutrinomasse aus der Kinematik des Tritiumzerfalls mit einer Sensitivität von $m_\nu < 0.2$ eV. KATRIN basiert auf einer fensterlosen gasförmigen Tritiumquelle und einem System aus zwei Spektrometern nach MAC-E-Filter-Prinzip. Im rückwärtigen Abschnitt der Tritiumquelle befindet sich eine goldbeschichtete Endplatte, die zugleich das elektrostatische Potential der Quelle definiert. Die Quellaktivität von 10^{11} Bq soll mittels der rückwärtig emittierten Zerfallselektronen während der Messung mit einem Monitor-Detektor überwacht werden. Eine Möglichkeit liegt im Nachweis der Brems- und Röntgenstrahlung, die von den Elektronen in der Endplatte erzeugt wird. Inhalt des Posters sind Simulation und experimentelle Untersuchung verschiedener Endplattentypen und Nachweismethoden.

Gefördert vom Sonderforschungsbereich Transregio 27 („Neutrinos and Beyond“) Teilprojekt A2.

HK 67.67 Th 14:00 Audi-Max

Measurement of the low energy secondary electron emission rate induced by cosmic rays. — •Henrik Arlinghaus, Marcus Beck, Christian Weinheimer, Hans-Werner Ortjohann, Volker Hannen, and Helmut Baumeister — Institut für Kernphysik, Universität Münster

The KATRIN (KArlsruhe TRItium Neutrino) experiment intends to determine the mass of the electron antineutrino to within 0.2 eV/c^2 (90% C.L.) via a measurement of the endpoint region of the tritium beta-decay spectrum. This requires a background rate of some few millihertz. In order to understand this background, a GEANT4 simulation of the electron background in the main spectrometer was written. The low energy secondary electron emission rate induced by cosmic muons in stainless steel, was determined experimentally, and used in the simulation.

We will present the design and results of an experiment at the University of Münster which we used to measure the number of electrons which were ejected by cosmic muons passing through a stainless steel electrode. Using plastic scintillators, the incident muon angle of the triggering muons was varied. The ejected electrons were accelerated and focused onto a silicon PIN detector, and their energy as well as arrival time distribution was recorded.

Preliminary results show a secondary electron production rate of under 5% for all measured angles.

This project is supported by BMBF under contract number 05A08PM1.

HK 67.68 Th 14:00 Audi-Max

Atomic Parity Violation in one Single Trapped and Laser Cooled Radium Ion: A Probe of Electroweak Running — •G.S. Giri, O. Boell, K. Jungmann, B.K. Sahoo, R.G.E. Timmermans, O.O. Versolato, L.W. Wansbeek, and L. Willmann — KVI, University of Groningen, The Netherlands

One single-trapped and laser cooled radium ion is an ideal candidate to investigate atomic parity non-conservation (APNC). APNC can serve as a low energy test of the Standard Model of particle physics. We aim for a precision measurement of the electroweak mixing angle, by probing the differential light shift of the 7S and 6D Zeeman sublevels. This shift is caused by the interaction of the ion with an off-resonant laser light field. With precision RF spectroscopy and subsequent electron shelving, the differential splitting can be determined to sub-Hertz accuracy. Recent calculations show that Ra$^+$ is a superior candidate for probing APNC [1]. With an almost identical set-up and using the electron shelving technique, ultra-narrow transitions in this ion can be exploited for an all optical, high stability frequency standard clock. We have succeeded in the production and subsequent slowing down of radium isotopes around ^{213}Ra. Further progress has been made in the development of ion traps and the necessary high precision optical laboratory. Laser spectroscopy of Ra$^+$ and the first ever trapping of this particle are being prepared.