

HK 62: Hauptvorträge III

Zeit: Freitag 11:00–13:00

Raum: S1/01 A1

Hauptvortrag HK 62.1 Fr 11:00 S1/01 A1
Baryon Spectroscopy - Recent Results from the CBELSA/TAPS Experiment at ELSA — ●JAN HARTMANN for the CBELSA/TAPS-Collaboration — HISKP, Universität Bonn

One of the remaining challenges within the standard model is to gain a good understanding of QCD in the non-perturbative regime. A key step towards this aim is baryon spectroscopy, investigating the spectrum and the properties of baryon resonances. To gain access to resonances with small πN partial width, photoproduction experiments provide essential information. Partial wave analyses need to be performed to extract the contributing resonances. Here, a complete experiment is required to unambiguously determine the contributing amplitudes. This involves the measurement of carefully chosen single and double polarization observables.

The CBELSA/TAPS experiment with a longitudinally or transversely polarized target and an energy tagged, linearly or circularly polarized photon beam allows the measurement of a large set of polarization observables. Due to its good energy resolution, high detection efficiency for photons, and the nearly complete solid angle coverage it is ideally suited for the measurement of photoproduction of neutral mesons decaying into photons.

In this talk recent results for various double polarization observables in single- and multi-meson final states will be presented and their impact on the partial wave analysis will be discussed.

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Hauptvortrag HK 62.2 Fr 11:30 S1/01 A1
Electromagnetic Probes of the Quark-Gluon Plasma — ●TORSTEN DAHMS — Excellence Cluster Universe, TUM, Garching, Germany

Electromagnetic probes, i. e. lepton pairs or photons, provide an excellent probe of the Quark-Gluon Plasma (QGP) produced in nuclear collisions at ultrarelativistic energies. Lepton pairs and photons are emitted, e. g. as blackbody radiation, during all stages of the collision. They preserve information about the properties of the medium at the time of emission as they remain unperturbed by strong final state interactions. Thus, their momentum and, in case of lepton pairs, their invariant-mass distributions are sensitive to the medium temperature but also to modifications caused by a possible restoration of chiral symmetry that is spontaneously broken in vacuum and responsible for

the generation of hadron masses. Measurements of such signals are extremely challenging due to the large background from ordinary hadron decays.

This talk will review the latest developments at the Relativistic Heavy Ion Collider and the Large Hadron Collider in the quest to measure the temperature of the QGP and to understand whether and how chiral symmetry is restored.

Hauptvortrag HK 62.3 Fr 12:00 S1/01 A1
Few-body universality in halo nuclei — ●HANS-WERNER HAMMER — Institut für Kernphysik, Technische Universität Darmstadt, 64289 Darmstadt, Germany

Few-body systems with resonant interactions show universal properties that are independent of the interaction at short distances. These properties include a geometric spectrum of three- and higher-body bound states and universal correlations between few-body observables. They can be observed over a wide range of scales from hadrons and nuclei to ultracold atoms. In this talk, I will focus on few-body universality in halo nuclei which can be considered effective few-body systems consisting of halo nucleons and a tightly bound core. This concept provides a unifying framework for the description of halo nuclei with systematically calculable corrections. I will discuss recent progress and future challenges in this field with a special emphasis on the prospects of observing Efimov states in halo nuclei.

Hauptvortrag HK 62.4 Fr 12:30 S1/01 A1
Upgrade of the GSI-Unilac as a FAIR High Current Injector — ●HENDRIK HÄHNEL — Institut für Angewandte Physik, Goethe Universität Frankfurt, Deutschland

The existing UNiversal Linear Accelerator (UNILAC) at GSI will serve as ion and dedicated uranium ion injector for the Facility for Antiproton and Ion Research (FAIR). For nominal FAIR operation, 15 emA of Uranium 28+ at low emittances have to be injected by multeturn-injection into FAIR. To meet these requirements and to ensure reliable operation, the UNILAC will undergo a significant upgrade process. Upgrade measures concerning key accelerator components are described and a main focus is put on a replacement of the 54m Alvarez-section by a compact IH-DTL. This will open new options for future injection schemes into SIS100.