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eta and eta' Physics at MAMI

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The A2 collaboration studies photoproduction mechanisms and decays of light mesons. The photon beam used, is produced through Bremsstrahlung of electrons in a thin radiator. The electrons are delivered by the MAMI accelerator with a maximum energy of E_e = 1604 MeV. Post-radiating electrons are momentum-analysed in the Glasgow-tagging spectrometer. In 2012, a new tagging spectrometer was successfully installed to cover the accessible eta'-photoproduction range. The target is located in the centre of the Crystal Ball-spectrometer. Forward angles are covered by a spectrometer-wall consisting of TAPS-crystals.

The experimental set-up described above is ideal for high-precision experiments on light pseudoscalar mesons in a clean production environment. Results from the Crystal Ball-experiment are competitive with other world-leading facilities. Especially results from neutral decays measured with the Crystal Ball are of exceptional precision. In this presentation, the capabilities for the production of light mesons with the Crystal Ball set-up at MAMI will be described. Furthermore, recent results from eta and eta' decays will be presented. Among these are the recent determination of the eta' cross-section near threshold with unprecedented accuracy, and a new determination of the eta transition form factor from the eta->e+e-g decay. At the end an outlook on future measurements will be given.

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