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Measurement of π^0 decays with the WASA detector at COSY

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The decay of the π^0 meson into an electron–positron pair is heavily suppressed in the Standard Model (SM) with an expected branching ratio of 6×10^{-8} . The decay is therefore sensitive to contributions from physics beyond the SM. Recently, the KTeV collaboration at Fermilab has performed a precise measurement of the $\pi^0 \rightarrow e^+ e^-$ decay branching ratio using a data sample of 800 events. The result is three standard deviations above the SM value. This has triggered speculations of e.g. a contribution from a light vector boson responsible for the annihilation of a hypothetical light dark matter particle. In one scenario a new light vector boson U (mass 10 – 100 MeV) is weakly coupled to the π^0 . This boson is expected to decay into a lepton pair and hence gives an extra contribution to the $\pi^0 \rightarrow e^+ e^-$ branching ratio. The aim for WASA-at-COSY is to confirm the KTeV measurement. The status of the analysis is presented and prospects for a measurement at the KTeV sensitivity are discussed.

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