



Contribution ID: 84

Type: Oral presentation

#01-84 Measurement of anomalies in angular correlation of electron and positron internally produced in excited 8Be and 4He

Tuesday, June 22, 2021 3:20 PM (20 minutes)

Theoretical prediction for the distribution of the angle between electrons and positrons originating in internal pair creations is a monotonic featureless decrease with the opening angle. Recent studies on excited states of 8Be and 4He nuclei, made in ATOMKI, Hungary, however, revealed deviations from this expectation. If true, such a result may have a fundamental impact: the anomaly can be explained by introducing a new short-lived neutral boson that can still fit into known experimental and theoretical constraints. Although serious work has been done on the theoretical side, an independent laboratory has not yet verified these results yet, although related experiments are being prepared worldwide. We present the ongoing construction of a suitable time-projection-chamber-based (TPC) spectrometer for light charged particles, utilizing magnetic field as a means for energy measurement and also Multiwire Projection Chambers (MWPC) together with Timepix3 pixel detectors, for unprecedented spatial and angular resolution. The experimental effort will be operated at the Institute of Experimental and Applied Physics (IEAP) Van-de-Graaff accelerator facility in order to confirm or either refute the above-mentioned anomaly. Details of the detectors will be shown, together with simulations that provide information on the expected performance of this system.

Primary author: PETOUSIS, Vlasios (IEAP - CTU)

Co-authors: Dr ALI, Babar; Mr FAJT, Lukas; Dr NATAL DA LUZ, Hugo; Dr SYKORA, Rudolf

Presenter: PETOUSIS, Vlasios (IEAP - CTU)

Session Classification: 01 Fundamental Physics

Track Classification: 01 Fundamental Physics