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Ancillary detectors at the K600 magnetic spectrometer

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Coincidence measurement capability was implemented at the K600 spectrometer in order to achieve higher selectivity and to obtain more information in nuclear structure studies. This presentation gives an overview of the technical solutions and performance of the ancillary detectors available at the K600 spectrometer. Dedicated electronics were installed allowing up to 160 detector channels to be coupled with the existing VME based data acquisition system. A new scattering chamber was designed for zero degrees and small angle measurements. This chamber was built to accommodate compact charged particle detector arrangements with minimum amount of material to allow simultaneous gamma-ray detection. The chamber is now operational at large angles (17-41 degrees) with sliding seal equivalent mechanism to operate optimally angle changes under vacuum conditions. The CAKE array (Coincidence Array for K600 Experiments) was implemented successfully and is now operated routinely at zero degrees and finite spectrometer angles. The silicon detectors are being optimised with a redesign of the segmentation for improved angular distribution measurements. The BaGeL (Ball of Germanium and LaBr3) array was implemented in the year 2016. Two measurements were performed successfully using 8 HPGe clovers and two large volume LaBr3 detectors. The integration of the GAMKA spectrometer is anticipated with various detector arrangements combining up to 17 HPGe clover detectors and 23 large volume LaBr3 detectors.

Summary

An overview of the ancillary detection setup at the K600 spectrometer is given with emphasis on performance and technical details of the CAKE and BaGeL arrays. Recent results are presented illustrating the enhanced sensitivity of the experimental setup. Future planned developments are also discussed.

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Primary authors: Dr SMIT, Frederick David (iThemba LABS); Mr LI, Kevin (Stellenbosch University, iThemba Labs); Dr PELLEGRI, Luna (University of Witwatersrand and iThemba LABs); Dr PAPKA, Paul (Stellenbosch

University); Dr ADSLEY, Philip (University of Stellenbosch/iThemba LABS); Dr NEVELING, Retief (iThemba LABS); Dr PESUDO, Vicente (UWC); Mr DYERS, Zaid (iThemba LABS)

Presenter: Dr PAPKA, Paul (Stellenbosch University)

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