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Nuclear Astrophysics with the K600 and the CAKE

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The K600 magnetic spectrometer at iThemba LABS has been augmented over the last few years with various ancillary detectors for coincidence measurements. One of these ancillary detector arrays is the Coincidence Array for K600 Experiments (the CAKE) which consists of double-sided silicon strip detectors.

One of the mainstays of the experimental programme of the K600 and the CAKE has been nuclear astrophysics, in particular the measurement of decay modes from excited states in nuclei, populated in direct reactions using the K600. Recent highlights include the observation and characterisation of possible low-energy resonances in the $^{12}\text{C}+^{12}\text{C}$ fusion reaction using the $^{24}\text{Mg}(\alpha, \alpha')^{24}\text{Mg}$ reaction, and a measurement of proton branching ratios in ^{22}Mg populated with the $^{24}\text{Mg}(p, t)^{22}\text{Mg}$ reaction.

This talk will introduce the K600 and the CAKE and discuss some recent highlights from experimental studies.

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