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Prospects for pair-transfer reactions at iThemba LABS

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Pair-transfer reactions such as (p,t) and $(^3\text{He},n)$ have been used to probe the pairing in nuclei. The nature of pairing in neutrinoless double-beta decay candidates can strongly impact the predicted nuclear matrix elements linking the ground states of the parent and daughter nuclei in neutrinoless double-beta decay candidates, with various different theoretical approaches such as the QRPA sometimes using the BCS pairing approximation. Evidence from pair-transfer reactions provides evidence for the breaking down of the BCS approximation in some nuclei.

This contribution will discuss experimental developments at iThemba LABS using the K600 magnetic spectrometer to measure (p,t) cross sections, and arrays of HPGe and neutron detectors to measure the $(^3\text{He},n)$ reaction, providing an excellent opportunity to probe the nature of pairing in nuclei, including neutrinoless double-beta decay candidates.

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