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Type: **Invited Talk**

## MAGNEX-FPD at iThemba LABS: enabling the heavy-ion detection capability at the K600 spectrometer facility

*Saturday, 2 December 2023 14:00 (25 minutes)*

In 2019, a new project focused on implementing the MAGNEX Focal Plane Detector (FPD) at the K600 spectrometer facility at iThemba LABS was started with the aim to facilitate experiments involving heavy-ion beams. The primary intention was to investigate Double Charge Exchange (DCE) reactions and competing quasi-elastic channels at various incident energies, expanding upon the research conducted at the INFN-Laboratori Nazionali del Sud (LNS) in Catania, Italy, as part of the NUMEN project. Once fully commissioned the K600+MAGNEX-FPD configuration will not only allow to perform nuclear structure and reaction studies with heavy-ion beams but it will also enable the capability to use low-energy light-ion beams that up to now was forbidden due to the characteristics of the K600-FPD.

The MAGNEX FPD has been successfully transported and tested in a stand-alone configuration at iThemba LABS. Presently, the MAGNEX-FPD is being coupled to the mechanics of the K600 medium dispersion focal plane. This phase will be followed by a commissioning step with low-energy beams and radioactive sources, to characterize the facility in terms of particle identification, energy and angle resolution and detection efficiency. In this picture it is foreseen also the use of the African LaBr<sub>3</sub>:Ce array (ALBA), made up of 21 large-volume LaBr<sub>3</sub>:Ce detectors, available in the full configuration at iThemba LABS, to allow particle-gamma coincidence measurements.

A general overview of the project and the scientific cases that could be studied will be presented.

### Attendance Type

In-person

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