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Weak Interaction Physics at SARAF

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In this talk I will review the current status of the radioisotopes trapping program at the Soreq Applied Research Accelerator Facility (SARAF), and prospects for measurements at the upgraded accelerator: SARAF-II.

In our new lab complex, situated above the SARAF target room, we utilize two systems: An electrostatic-ion-beam-trap, designed for trapping various radioactive ions, starting with ${}^6\text{He}$; and a magneto-optical trap, which is designated for various rare neon isotopes, starting with ${}^{23}\text{Ne}$.

Both traps are equipped with novel designs for the detection of recoiling particles from nuclear β -decay and precise measurements of the kinematic correlations between them. These correlations are sensitive to scalar- and tensor-current interactions which are suggested by some beyond standard model (BSM) theories [2]. Bounds on exotic interactions from the precision and high-energy frontiers are interpreted in the framework of a model-independent effective field theory approach [3].

[1] I. Mardor *et. al.*, **The Soreq Applied Research Accelerator Facility (SARAF) - Overview, Research Programs and Future Plans** (2018).

[2] J A Behr and G Gwinner, **Standard model tests with trapped radioactive atoms** (2009).

[3] M. Gonzalez-Alonso, O. Naviliat-Cuncic, N. Severijns. **New physics searches in nuclear and neutron β -decay** (2018).

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