The new operational Slow POsitron faciliTy in Israel: SPOT-IL

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The Slow POsitron faciliTy in Israel (SPOT-IL), located at the Hebrew University of Jerusalem, is now operational. The SPOT-IL beam follows a traditional design [1], using a ^{22}Na source, ~40mCi [2]. A tungsten foil moderator was annealed prior to its mounting on the source capsule. A compact new design of the source shielding allowed convenient positioning of the source onto the moderator. A grounded target cell allows sample changing without breaking the beam-line vacuum and is designed to allow a combined measurement of sample conductivity and Doppler Broadening (DB), with the flexibility to add more detection options in the future, such as low temperature for integrated in-situ electronic measurements. The detection system is comprised of HPGe and BaF_2 detectors, facing each other, for low background DB measurements.

The successful operation of the beam was proven by a controlled positron beam spot seen on an MCP phosphor screen, located at the beam-dump position, and by the detection of the 511keV annihilation peak when a Perspex sample was positioned in the beam in front of the detectors.

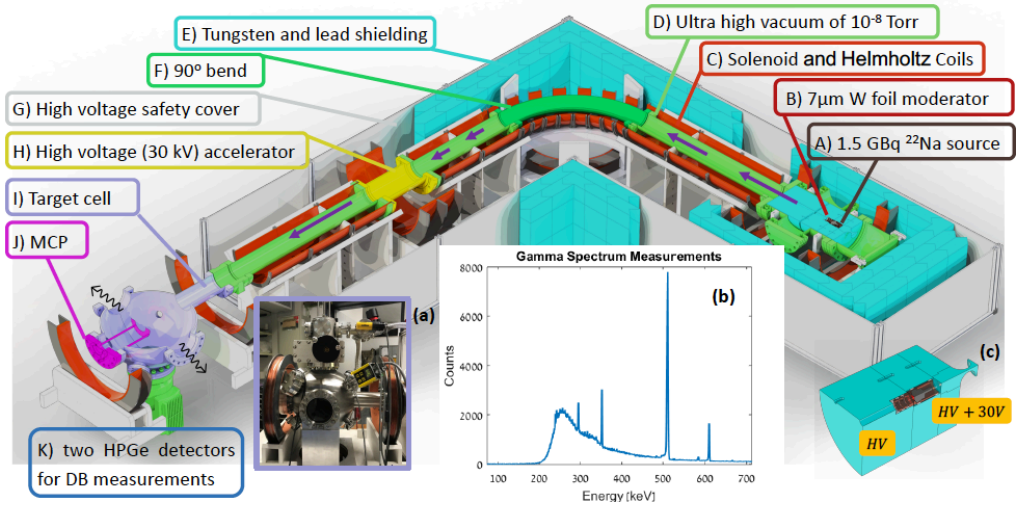

Figure 1 *A model section view of SPOT-IL. (a) The target cell. (b) A γ spectrum (HPGe), with a peak of 8000 counts at 511 keV (c) Section view of the source shielding with the pre-accelerator.*

References

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