

Pulsed Low Energy Positron Beams for Fusion Materials

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Pulsed low-energy positron beams of variable energy are powerful tools for non-destructive defect depth profiling of small open volume defects such as vacancies, vacancy-clusters, dislocations, grain boundaries, internal surfaces, and voids in materials relevant to fusion and fission with positron annihilation lifetime spectroscopy (PALS) [1].

The Pulsed Low-Energy Positron System (PLEPS) at the NEPOMUC positron source at the MLZ in Garching (FRM-II), developed and operated by the University of the Bundeswehr München, is a pioneering instrument for one-dimensional depth-resolved defect profiling with PALS [1].

In this contribution we describe the operational principles of PLEPS in its current configuration. Selected applications of PLEPS in characterizing irradiation damage in fusion and fission materials are then presented to highlight the unique capabilities of our pulsed beam technology [2-4]. Finally, we provide an outlook on future developments.

References:

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