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Novel CDB Data Processing and Evaluation Software

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The Coincidence Doppler-Broadening (CDB) spectrometer at NEPOMUC has recently been upgraded with six additional HPGe Detectors, bringing the total number of detectors to ten. To take full advantage of the even more capable instrument, a novel data evaluation software package (STACS) is currently under development. The software can already handle and visualize the data generated by Coincidence Doppler-Broadening Spectroscopy (CDBS) and provides a wide range of tools to analyze such data. Some of the main functions include the extraction of the electron-positron annihilation photo peak from CDB spectra as well as a simple background subtraction algorithm that is able to increase the peak-to-noise ratio of the extracted photo peak further. This combined with a new multi detector CDB function, which enables the combination of the data from all 10 detectors, provides detailed information about the chemical environment of the positron annihilation site. The software capabilities were tested on W and Kapton measurements with high statistics to investigate materials with both predominantly high and low Doppler shifts. Measurements on the precipitation hardening properties of Al alloy samples were subsequently performed and will be shown.

Primary author: CHRYSSOS, Leon

Co-authors: HUGENSCHMIDT, Christoph; MATHES, Lucian; BURWITZ, Vassily Vadimovitch

Presenter: CHRYSSOS, Leon

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