Contribution ID: **20** Type: **Talk (20 min + 5 min discussion)**

Spatially Resolved and Element-Sensitive Defect Analysis with Positrons

Monday, 4 December 2023 17:35 (25 minutes)

The Coincidence Doppler Broadening (CDB) spectrometer with its monoenergetic scanning positron beam allows the investigation of defect distributions in three dimensions (3D) and the elemental surrounding of open-volume defects. With thsi instrument we address the following scientific questions: Homogeneity of samples, i.e. depth and lateral distribution of lattice defects. Examples are (laser beam or friction stir) welded technical alloys, irradiated materials, superconducting and (doped) thin semiconducting films; defect kinetics and fast defect annealing at high temperatures, e.g. of samples after severe plastic deformation or plasma-facing materials for fusion reactors; vacancy-solute complexes and nano-clusters in, e.g. doped semiconductors or precipitation-hardened alloys; in-operando defect analysis of samples, which are not stable in vacuum, exposed to gases and/or during application of el. fields. Examples are electrode materials or aging of thin polymer films in various atmospheres; fundamental research with otho-Positronium (o-Ps).
Wihtin this presentaiotn we discuss potential upgrades of the CDB spectrometer in terms of (i) spatial resolution, (ii) measurement time , and (iii) high sample temperature.

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