Progress of the EPOS project: Gamma-induced Positron Spectroscopy (GiPS)
(Reinhard Krause-Rehberg, Wolfgang Anwand, Gerhard Brauer, Maik Butterling,
Tom Cowan, Andreas Hartmann, Marco Jungmann, Arnold Krille,
Ronald Schwengner, and Andreas Wagner, p. 2451)

With contributions from the
15th International Conference on Positron Annihilation (ICPA-15)

Guest Editor: Bichitra Nandi Ganguly
The GiPS facility (Gamma-induced Positron Spectroscopy) has been set up for user operation at the Research Center Dresden-Rossendorf, Germany, in 2009. A bunched electron beam from a superconducting linear accelerator (LINAC) in cw mode (bunch length < 5 ps; repetition time 38 ns) generates bremsstrahlung photons up to 20 MeV. The photon beam hits the sample and positrons are generated by pair production in the whole sample volume. All important positron techniques are applied to study the real structure of bulky samples (coarse powder, samples for non-destructive testing, liquids, activated samples). Due to the unique time structure, positron lifetime and AMOC (Age-Momentum Correlation) measurements are possible. Coincidence Doppler Broadening Spectroscopy (CDBS) is also available. The spectra of all techniques were proven to exhibit extraordinary quality, as is reported by Reinhard Krause-Rehberg et al. on p. 2451 ff.

Positron annihilation, as a well-established experimental tool in the materials science community, provides unique information about the behavior of the material microstructure after radiation treatment. The experimental simulation of radiation damage by charged particle implantation is, as a first approach, a very reasonable way to study radiation embrittlement. The article presented by Vladimir Krsjek et al. on p. 2339 ff. discusses this timely topic on recent experiments on helium implanted Fe–Cr model alloys. Simultaneous results from positron beam and conventional depth profiled positron lifetime techniques are demonstrated. In the cover picture, the intensity of the positron lifetime component \( I_4 \) characterizes the presence of large open volume defects.
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