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P95 - Tomographic examination of ion tracks by ion microbeam energy loss analysis

Friday, 11 July 2014 13:00 (1 hour)

A nondestructive tomographic approach (i.e., ion microprobe energy loss spectroscopy) for the study of density inhomogeneities (e.g., etched nuclear tracks) in thin solid films (e.g., polymer foils) is introduced. In the method, the tomographic data are obtained by analysis of the energy loss of ions passing through the spatial micro-inhomogeneities (vacancies or densifications) and registering by solid state detector placed behind the target foil. The energy spectra from the scanning areas (with the size of ~ 1 or more micrometers) are subjected to the MC simulation - anlysis by a set of codes corresponding to the various shape patterns. The optimal fit of the experimental data is obtained by gradual variation of the microobject spatial parameters. The method enables determination of the 3D form of the pore, study of dynamic processes, such as pore gradual evolution in the etching procedure, or filling of the pore hollow with materials of different densities. For randomly-shape material inhomogeneities, the method has to carry out a set of energy loss tomographic scans from different inclining angles. Here, an application of ion microprobe in tomographic examination of ion tracks (process of their evolution and filling) is presented and discussed.

Primary author: Dr VACIK, Jiri (Nuclear Physics Institute, Academy of Sciences, Czech Republic)

Co-authors: Dr HAVRANEK, Vladimir (Nuclear Physics Institute, Academy of Sciences, Czech Republic); Dr HNATOWICZ, Vladimir (Nuclear Physics Institute, Academy of Sciences, Czech Republic)

Presenter: Dr VACIK, Jiri (Nuclear Physics Institute, Academy of Sciences, Czech Republic)

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