

Investigation of the reactor neutron irradiated Si single crystal by a low energy neutron scattering.

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In this research the low energy neutron diffraction technique, a non-destructive technique, was applied to analyze hadron generated clusters. The Si single crystals were irradiated in TRIGA nuclear reactor to the neutron fluence $1 \times 10^{16} \text{ cm}^{-2}$.

The experiment was performed on IN3 beam at ILL (www.ill.fr). Instrument was used in fully elastic mode, with incident and scattered wave vectors of 2.662 \AA . In order to improve instrument resolution, analyzer was used in single central blade configuration (flat geometry), and collimations before and after sample were set to $20'$. High temperature was achieved thanks to a standard ILL furnace. To reduce as much as possible background, shielding and sample holder were made of vanadium.

The neutron scattering was measured in the FZ Si samples at room temperature: 1. before irradiation, 2. after irradiation and 3. after annealing at high temperature.

Primary authors: VAITKUS, Juozas (Vilnius University); Dr LEMEE-CILLEAU, Marie-Helene (ILL); Dr BOEHM, Martin (ILL); MOLL, Michael (CERN)

Presenter: VAITKUS, Juozas (Vilnius University)

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