Contribution ID: **142** Type: **Oral report**

Capabilities of Probe Emission Mössbauer Spectroscopy for Studies on Post-effects of Critical Radiation Exposure in Tantalum

Saturday 25 September 2021 16:20 (25 minutes)

By the use of 57Co impurity atoms as structure-sensitive physico-chemical probes and X-ray Diffraction method, post-effects of critical radiation-induced effects have been studied that resulted from irradiation of metal tantalum with charged particles.
The small (less than 0.2 μm) thickness of surface layers of samples doped with 57Co atoms enabled the direct radiation damage of Ta crystal lattice by proton beams to be excluded (the number of displaced atoms being negligibly low, of less than 0.1 vacancies/ion), as well as the consequences of irradiation of the metal by their "own"Ta atoms to be studied (the number of the displaced atoms being 3900 vacancies/ion), these atoms having been knocked out of the crystal lattice during target bombardments.
The experimental data obtained by both Emission Mössbauer Spectroscopy and X-ray Diffraction methods have shown that irradiation of metal with heavy ions (atoms of Ta) is accompanied by disordering of the metal surface layers: by the formation of thermal- and displacement spikes in metal Ta.

Primary author: ALEKSEEV, Igor (V.G. Khlopin Radium Institute)

Co-author: Dr ZHEREBCHEVSKY, Vladimir (St. Petersburg State University)

Presenter: ALEKSEEV, Igor (V.G. Khlopin Radium Institute)

Session Classification: Section 3. Modern nuclear physics methods and technologies

Track Classification: Section 3. Modern nuclear physics methods and technologies.