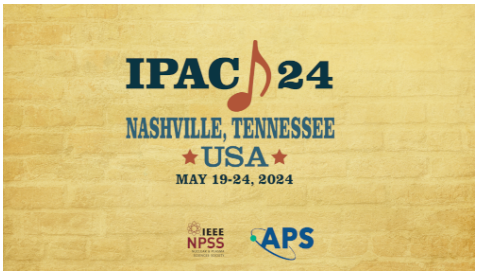


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# Irradiation damage characterization of positron source materials

*Tuesday, 21 May 2024 16:00 (2 hours)*

The secondary beam production target at future positron sources at the Continuous Electron Beam Accelerator Facility (CEBAF), the International Linear Collider (ILC) or the Future Circular Collider (FCC), features unprecedented mechanical and thermal stresses which may compromise sustainable and reliable operation. Candidate materials are required to possess high melting temperature together with excellent thermal conductivity, elasticity and radiation hardness properties. In order to substantiate the material choice for the CEBAF and ILC positron sources, the response of candidate materials such as titanium alloys, tungsten, and tantalum to electron beam irradiation was experimentally investigated. CEBAF and ILC expected operating conditions were mimicked using the 3.5 MeV electron beam of the MAMI facility injector. The material degradations were precisely analyzed via high energy X-ray diffraction at the HEMS beamline operated by the Helmholtz-Zentrum Hereon at the PETRA III synchrotron facility. This work reports the results of these measurements and their interpretation.

## Footnotes

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