

VA 2: Vacuum Technology: New Developments and Applications – Poster

Time: Monday 14:00–16:00

Location: P2/OG2

VA 2.1 Mon 14:00 P2/OG2

A Novel Multilayer Barrier Coatings For Improved Cold-Field Electron Emitters — •DANIEL BURDA — Institute of Scientific Instruments of the CAS, v. v. i., Královopolská 147, 612 64 Brno, Czech Republic

By fabricating ultrathin, hard multilayer barrier coatings on top of the cold-field tungsten emitter, the parameters of the electron emission can be tuned. A multilayer structure of semiconducting and dielectric layers, i.e. Al₂O₃, HfO₂, on top of the electropolished tungsten tip is fabricated using Atomic Layer Deposition. The introduction of multilayered barriers enables modification of macroscopically observable electron emission parameters. The optimized material properties of the multilayer structure such as number of layers, thickness of single layers, and crystallinity lead to improvements in the emitted electron beam parameters, mainly in lowering the threshold emission voltage, increasing the spatial and temporal electron beam stability.

VA 2.2 Mon 14:00 P2/OG2

Repairing the seal faces of an MBE main flange — •TIMO A.

KURCHAT^{1,2}, SASCHA R. VALENTIN², FINN KRAGE¹, and ANDREAS D. WIECK¹ — ¹Angewandte Festkörperphysik, Ruhr-Universität Bochum, Universitätsstraße 150, D-44780 Bochum — ²Gesellschaft für Gerätebau mbH, Klönnestraße 99, D-44143 Dortmund

During the refurbishment of an MBE the surface of the main flange was attacked by an etching solution used for cleaning. This also affected the seal faces of the 500 mm main flange, a 250 mm CF flange and five 40 mm CF flanges. The surface was very rough and therefore not UHV compatible any more.

In the absence of a sufficiently large lathe and because the 40 mm flanges are not arranged concentrically, we designed manual tools with specialized geometry to sand and polish the flanges. The grid size of the sandpaper used was between 1000 and 3000. The seal faces were polished until the surfaces were smooth and specular again. After cleaning and assembly, we performed a leak test and did not find any leaks after the procedure.

The details of the individual work steps, the geometry of the tools, and also the tools themselves will be shown.