FAKULTA ELEKTROTECHNIKY A KOMUNIKAČNÍCH TECHNOLOGIÍ

Supervisor´s report

Student: MSc. Zuzana Košelová

Supervisor: Assoc. prof. Zdenka Fohlerová

Faculty: Faculty of Electrical Communication and Technology, Department of Microelectronics

Year of defense: 2025

Topic: Deposition of amorphous thin films for improved function of cold field emitters

The dissertation work of Zuzana Košelová addressed the key challenge of optimizing coating material and thickness to improve stability, and performance of tungsten emitters which is critically important for high-resolution TEM and scanning TEM. The student focused on deposition and optimization of a thin oxide layer on tungsten tip by thermal oxidation and anodization. The experimental work involved a series of chemical and morphological characterizations, completed by a field electron microscopy measurement in ultra-high vacuum. The advanced Murphy–Good theory, employed as the main model for interpreting field emission data, together with other theoretical approaches, provided a deeper insight into the understanding of physical mechanisms.

The student has demonstrated a very good ability to connect theoretical concepts with experimental techniques and to interpret the results obtained in a broader scientific context. This is evidenced by 2 first author and 3 co-author articles published in peer-reviewed scientific journals indexed in WOS. The student actively presented the results of the research at 6 national and international conferences, which reflects her openness in sharing the findings with the scientific community. It is also good to mention that the conference attendances, often in the form of oral presentations, were also awarded in several cases. Overall, Zuzana Košelová worked actively, learned effectively and provided valuable support for teaching activities. The dissertation represents a relevant and well-executed piece of work that proves the student's ability for independent research and systematic problem solving.

I consider the results achieved to be of scientific significance and practical relevance, and I therefore recommend the dissertation for defense.

In Brno, 4.11.2025

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Assoc prof. Zdenka Fohlerová

supervisor