Applied photonic structures: from spectroscopy to smart devices

Kamil Postava

VSB - Technical University of Ostrava,

Faculty of Materials Science and Technology

Department of Materials Engineering and Recycling

e-mail: kamil.postava@vsb.cz

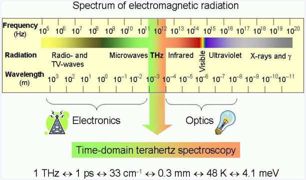
VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY | DEPARTMENT OF MATERIALS ENGINEERING AND RECYCLING

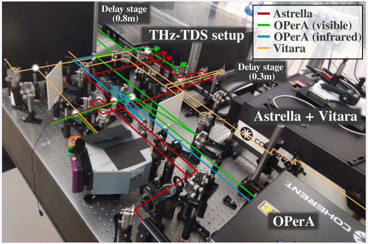
Photonics laboratory

VSB TECHNICAL UNIVERSITY OF OSTRAVA | FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY | DEPARTMENT OF MATERIALS ENGINEERING AND RECYCLING

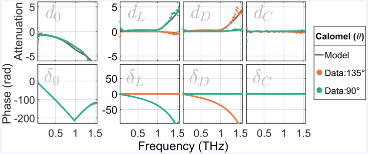
Research

1. Terahertz complete Time-Domain Spectroscopic Ellipsometry (THz-cTDSE)



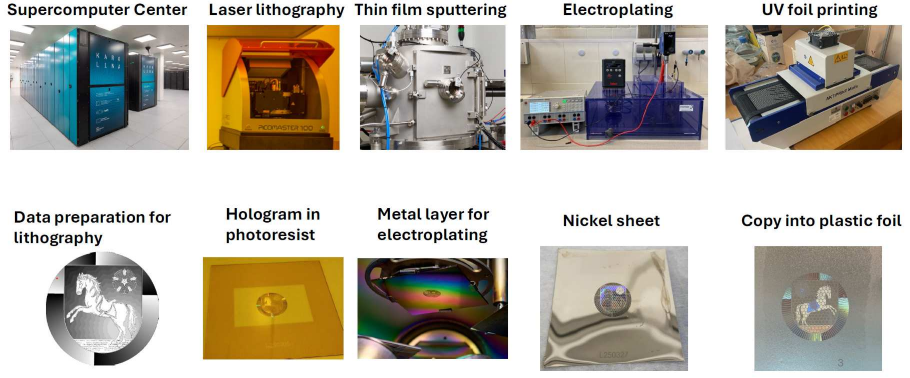


- measured waveform using ultrashort fs optical pulses
- spectrum calculated using complecs Forier transform
- applied for contactless measurement o electrical properties



P. Koleják, J. Liu, R. Silber, M. Mičica, O. Ballada, Č. Barta, R. Lebrun, N. Tiercelin, M. Vanwolleghem, and K. Postava, Terahertz time-domain ellipsometry with spintronic emitters: Pauli coefficients as a superior alternative to Jones and Mueller matrices, IEEE Trans. Terahertz Sci. Technol. 15, 606–621 (2025).

Complete security holography prototyping at VSB-TUO

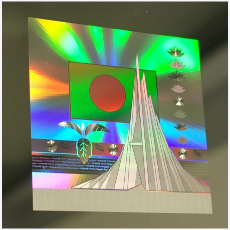


Patents: T. Kohut, L. Kotacka, K. Postava, D. Tomlinson, AU2025903742 - Security feature, security document and methods of manufacture, AU2025903740 - Micro-optic security feature.

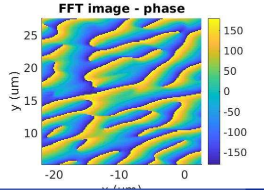
Research

2. Diffractive and security holografic optics

applied security holograms made at VŠB-TUO

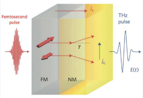


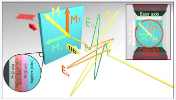
computer generated holograms and polarization effects

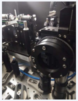


Projects

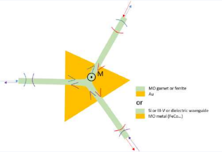
- S-Nebula **FET OPEN H2020**, Novel spin-based building blocks for advanced TeraHertz applications (coordinator Thales, France)

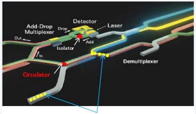






- Circulight – **Horizon Europe EIC-PathFinderOpen** – Circulating light on any photonic platform (coordinator CNRS–C2N, France, 9 partners)





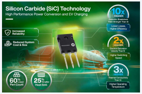
Optical interconnects, optical circuitry, nanoantennas, isolators, circulators

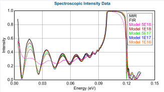
- OP JAK (Matur, MEET), OP TAK (BBT, Zebr), Refresh, GAČR, TAČR

International collaboration with academic and industry

- **academic collaboration** – joint supervision of doctoral studies
- **industrial collaboration**

- **semiconductor ecosystem** – SiC material technology





December 9, 2025 (9:00–11:15) – Silicon carbide – material and applications (VŠB-TUO announced soon).

Conclusion

What we are offering

- complete ellipsometric and spectroscopic measurement in wide spectral range ($\lambda = 190$ nm – 1 mm), incluing aniotropy
- knowledge in optics, nanooptics and photonics
- design and optimization of photonic structures using advanced modeling tools

What we are looking for

- collaboration with industry
- patners for joint research and development projects

Invitation to
24th Czech-Polish-Slovak Optical Conference & Joint Workshop of Czech optical Claster and Polish Photonic Claster – September 14-18, 2026.

Contact: `kamil.postava@vsb.cz`

Conclusion

What we are offering

- complete ellipsometric and spectroscopic measurement in wide spectral range ($\lambda = 190$ nm – 1 mm), incluing aniotropy
- knowledge in optics, nanooptics and photonics
- design and optimization of photonic structures using advanced modeling tools

What we are looking for

- collaboration with industry
- patners for joint research and development projects

Invitation to
24th Czech-Polish-Slovak Optical Conference & Joint Workshop of Czech optical Claster and Polish Photonic Claster – September 14-18, 2026.

Contact: `kamil.postava@vsb.cz`