Poster-2-33

Experimental Toolbox for Optical Magnetometry and Ultrafast THz Spectroscopy driven by an Open Source Python-Based Software

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In the Dynamic Quantum Materials Laboratory, we aim to study materials with properties that can be changed on-demand on a sub-picosecond time scale. For instance, one of our projects is to generate magnetic fields in an ultrafast manner by driving chiral phonons with THz light [1-3], and another aims at controlling the quantized magnetic flux in ring-shaped superconductors [4]. In this poster, I will present some of the experimental tools we are developping to reach these goals. They include new optical magnetometry setups based, for instance, on polarization-resolved cameras and magnetic detectors placed close to the solid of interest. I will also discuss the implementation of PyMoDAQ [5], a Python framework allowing to interface any kind of experiments in an easy, robust and reproducible way.

[1] Jiaming Luo et al. ,Science 382, 698-702 (2023).
[2] Basini, M., Pancaldi, M., Wehinger, B. et al. Nature 628, 534-539 (2024).
[3] Davies, C.S., Fennema, F.G.N., Tsukamoto, A. et al. Nature 628, 540-544 (2024).
[4] Hennadii Yerzhakov, Tien-Tien Yeh, Alexander Balatsky et al., https://doi.org/10.48550/arXiv.2404.16276.
[5] S. J. Weber; Rev. Sci. Instrum. 1 April 2021; 92 (4): 045104.