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Optimization of printed Perovskite Solar Cells using X-Ray scattering

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In the past few years, perovskite solar cells (PSCs) received a lot of awareness in research due to their low manufacturing cost, high efficiency, and high specific power. For industry, PSCs are very interesting because of their easy solution-based fabrication process and comparable efficiencies with the established c-Si-based solar cells.^[1] Thus, the fabrication can be upscaled with low waste deposition technologies like printing. Being fast and using minimal material, slot-die coating is a very promising technique.^[2] During our work we optimize printed PSCs on flexible substrates and investigate their suitability for the application in space environment.^[3] The objective is the development of PSCs by applying different compositions and measuring techniques like spectroscopy and real-space imaging in combination with X-ray scattering methods.

^[1] Green, M., et al. (2021). “Solar cell efficiency tables (version 57)”. Prog. Photovolt. Res. Appl. 29: 3–15.

^[2] Patidar, R., et al. (2020). “Slot-die coating of perovskite solar cells: An overview.” Materials Today Communications 22: 100808.

^[3] Reb, L., et al. (2020). “Perovskite and organic solar cells on a rocket flight”. Joule 4, 1880–1892.

Author: LINDENMEIR, Christoph

Co-authors: VITALONI, Andrea (TUM); REB, Lennart (TUM E13); SCHEEL, Manuel (TUM E13); MÜLLER-BUSCHBAUM, Peter (TU München, Physik-Department, LS Funktionelle Materialien)

Presenter: LINDENMEIR, Christoph

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