



Imaging and Chemical Mapping of Perovskite Optoelectronic Devices

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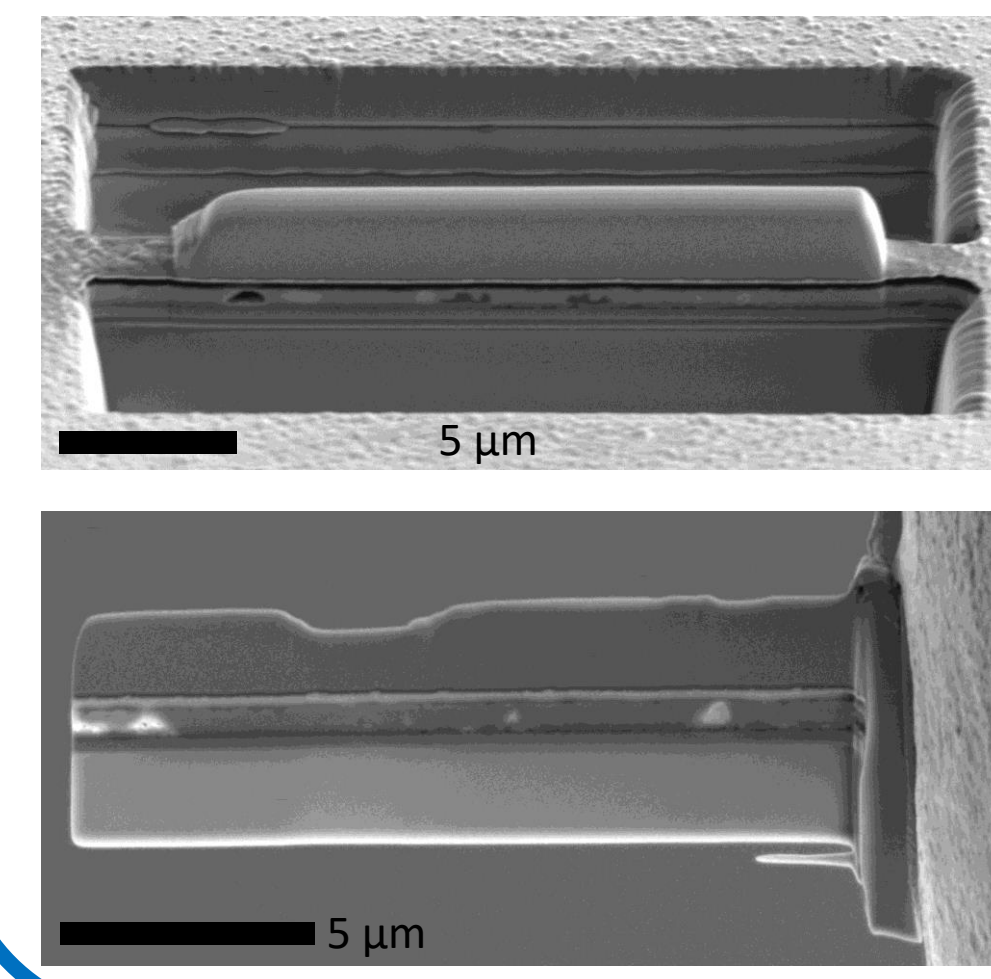
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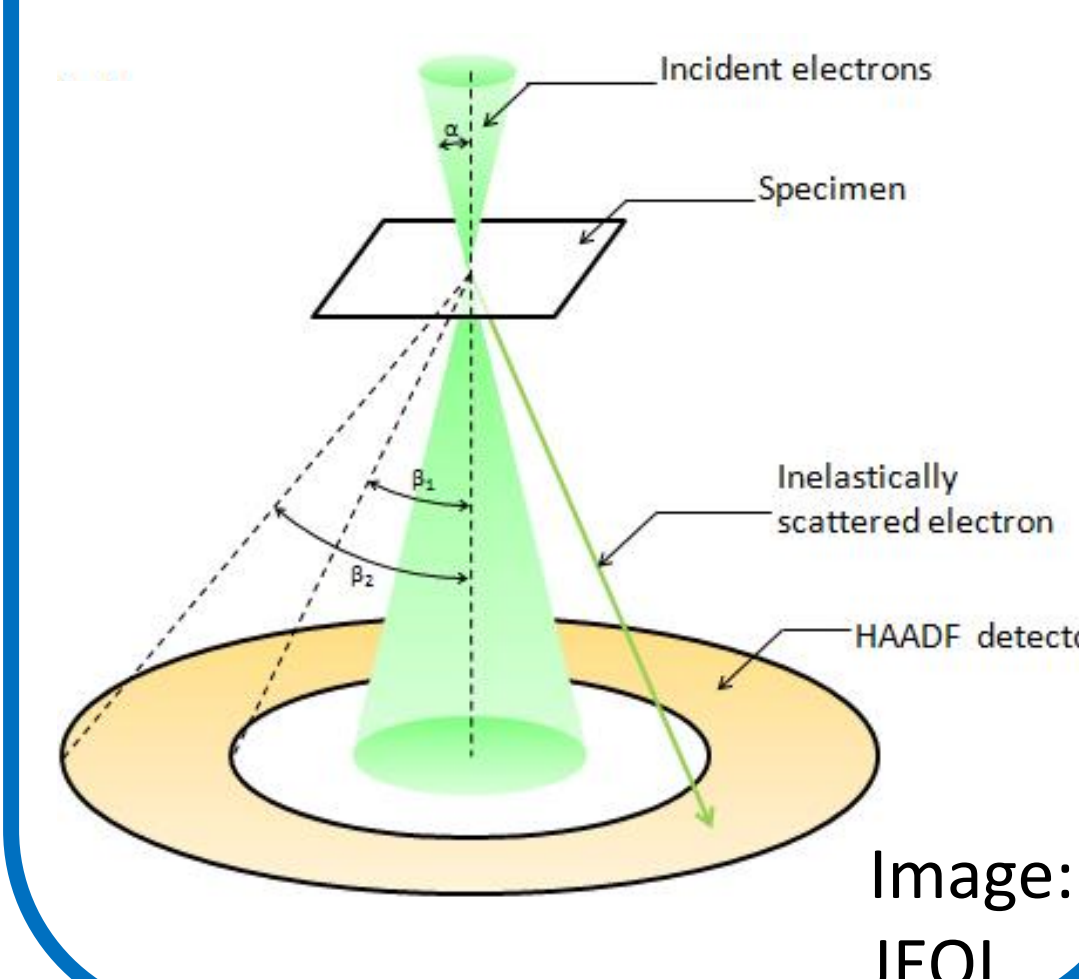
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Hybrid perovskites are heterogeneous on multiple length scales. Nanoscale characterisation by analytical electron microscopy (blue boxes) can reveal degradation mechanisms and highlight rational paths toward more efficient and stable devices. Zoom in on the green boxes to see examples from Cambridge!

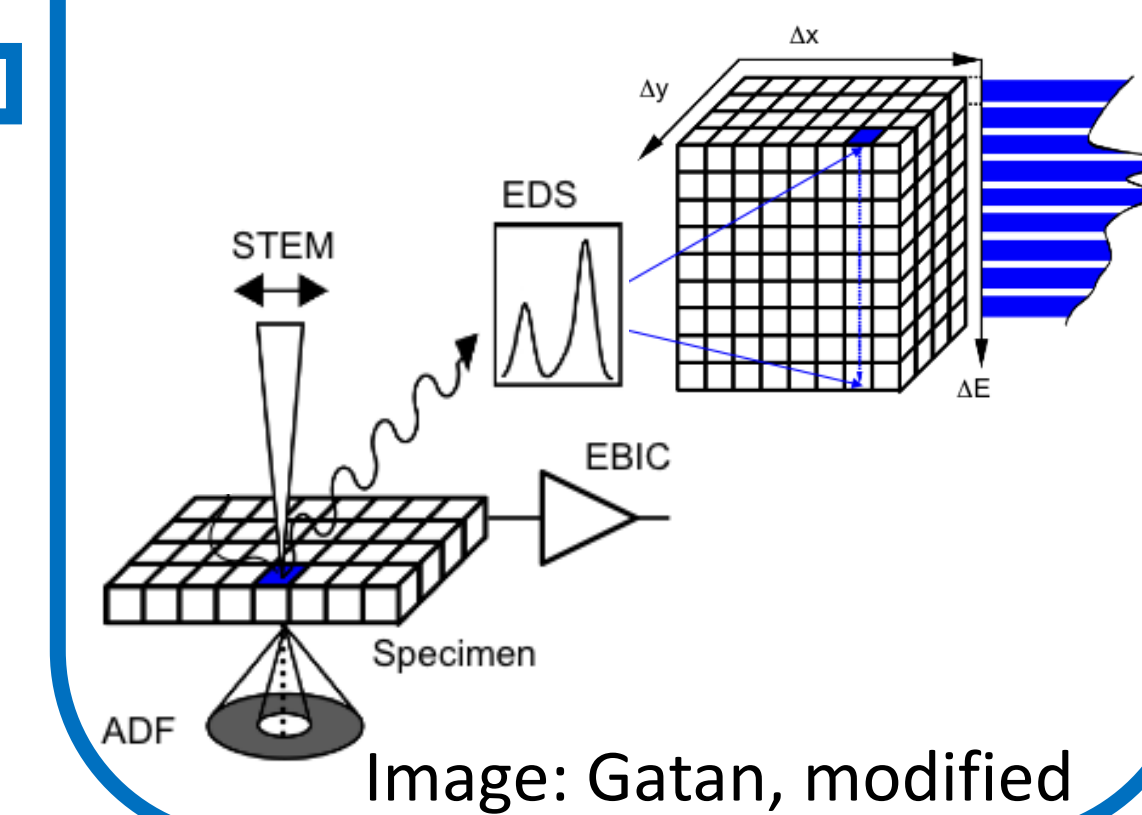
Cut cross-sectional slice



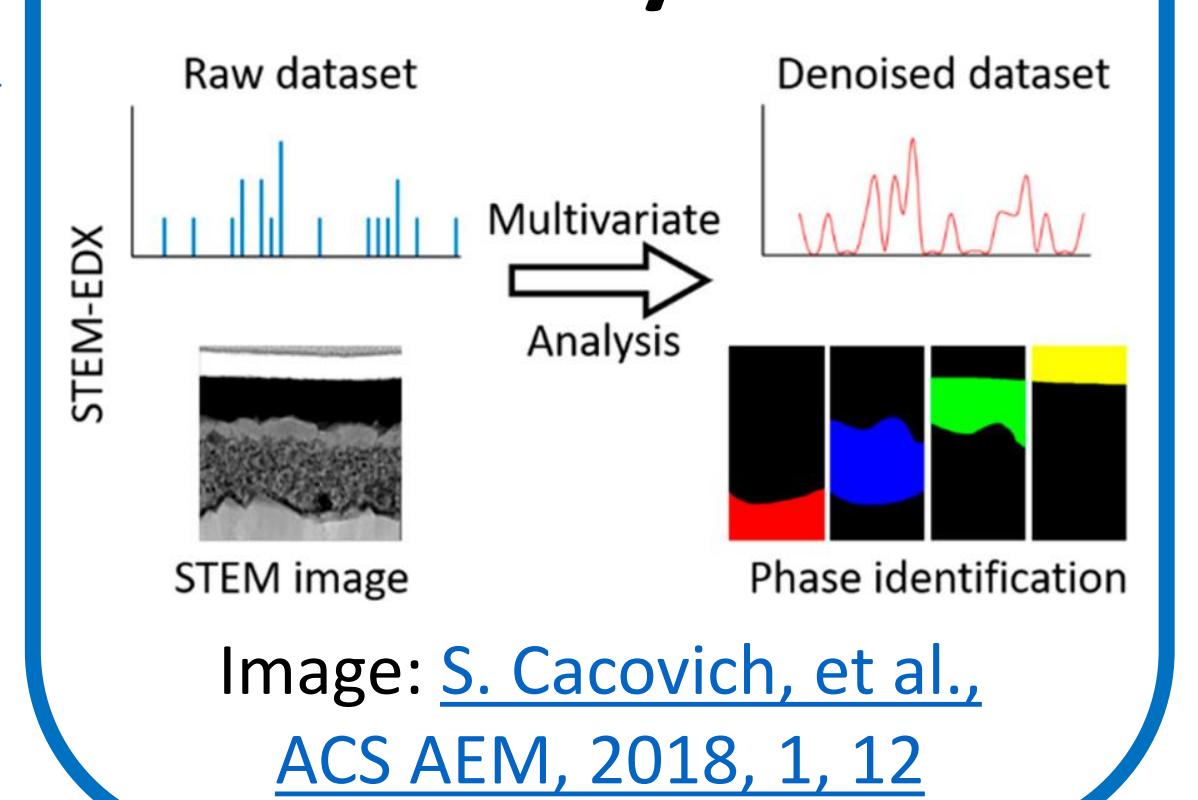
Z-contrast imaging



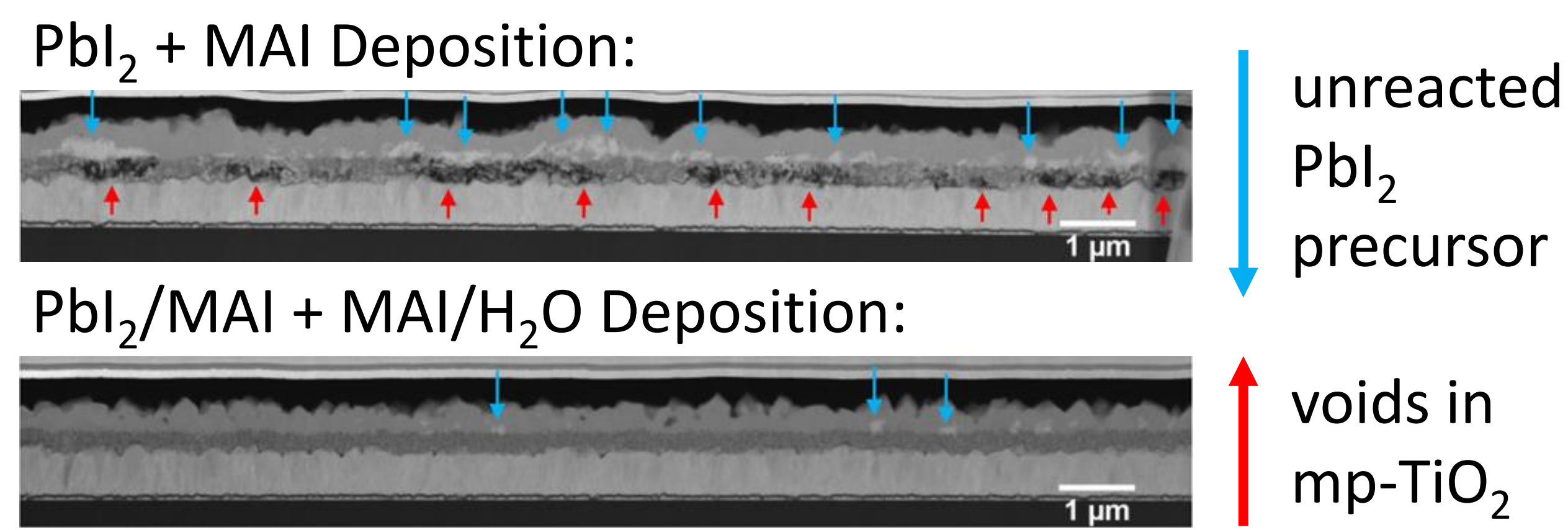
Chemical mapping via STEM-EDX



Multivariate statistical analysis

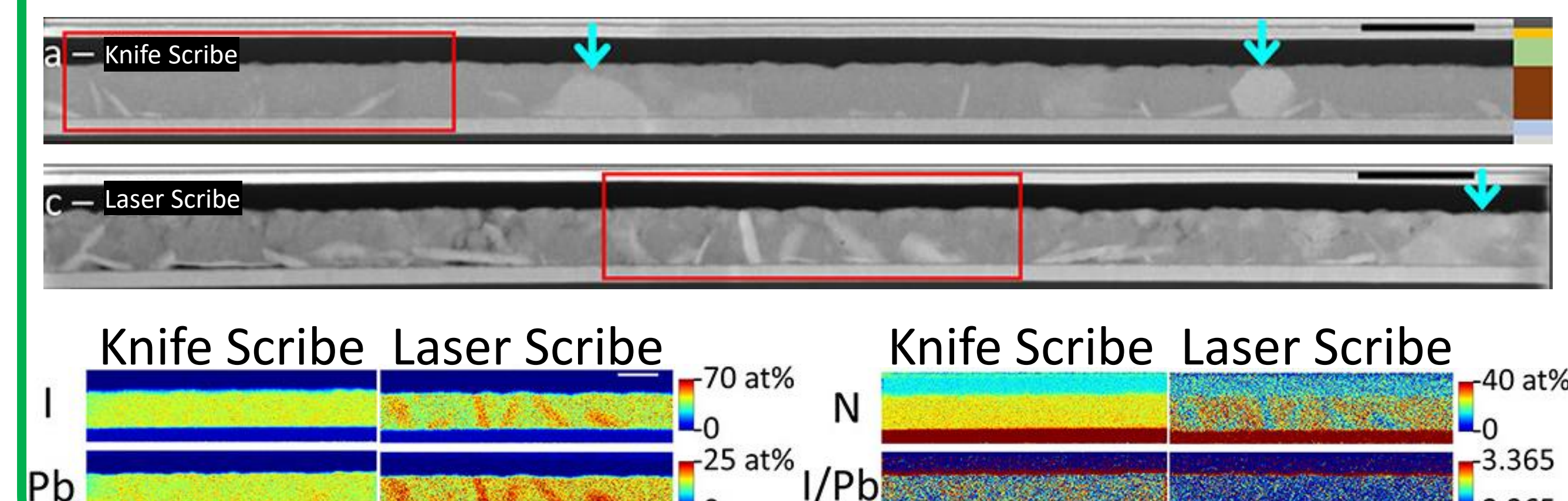


Morphology of perovskite layer and non-perovskite phases



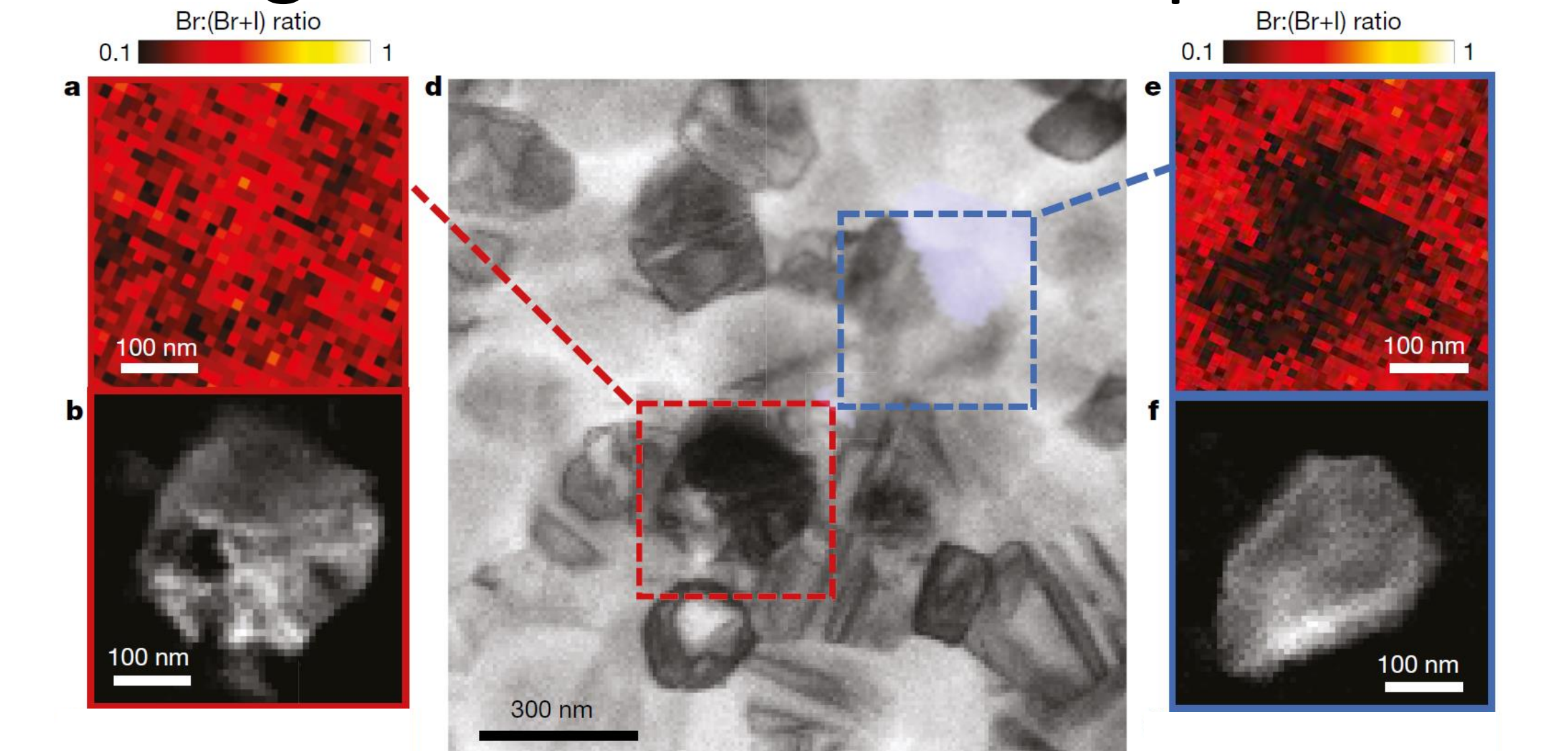
F. Matteocci, L. Vesce, F.U. Kosasih, et al., ACS AMI, 2019, 11, 28

Laser scribing-induced perovskite decomposition in solar modules



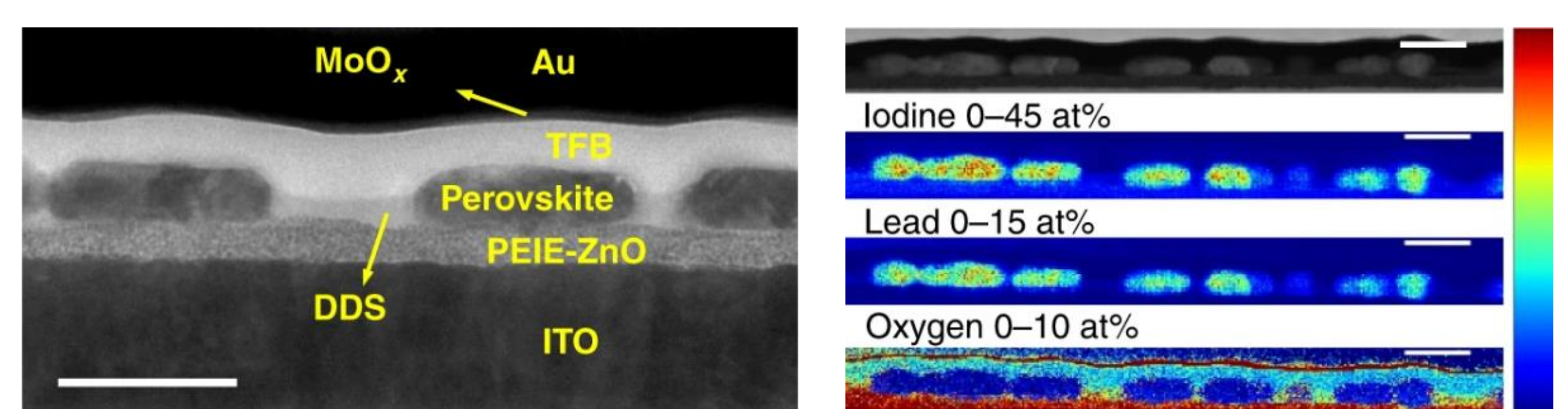
F.U. Kosasih, L. Rakocevic, et al., ACS AMI, 2019, 11, 49

Origin of non-radiative trap sites



T.A.S. Doherty, A. Winchester, et al., Nature, 2020, 580, 7803

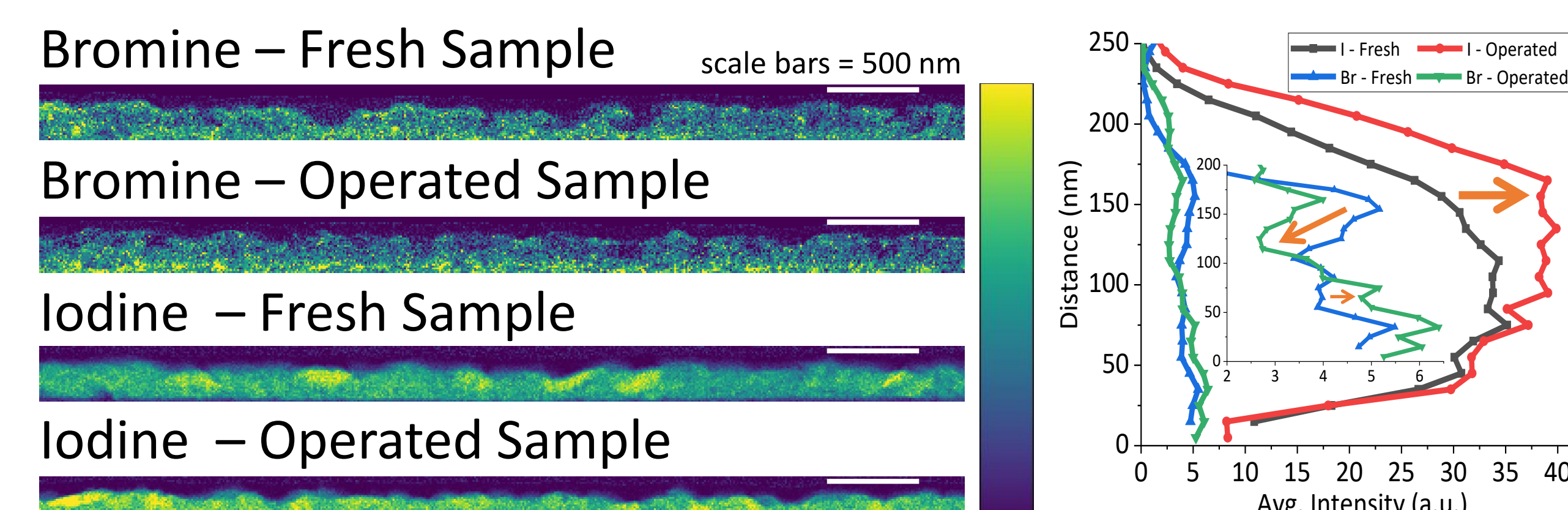
Spatial location of performance-boosting organic molecules in solar cells



DDS = 4,4'-diaminodiphenyl sulfone, scale bars = 200 nm

H. Wang, F.U. Kosasih, et al., Nat. Commun., 2020, 11, 891

Degradation-induced compositional changes in perovskite LEDs



Z.A. Garmaroudi, M. Abdi-Jalebi, F.U. Kosasih, et al., in preparation

Funding available for collaborative projects requiring access to electron microscopes at Cambridge Materials:

www.esteem3.eu

