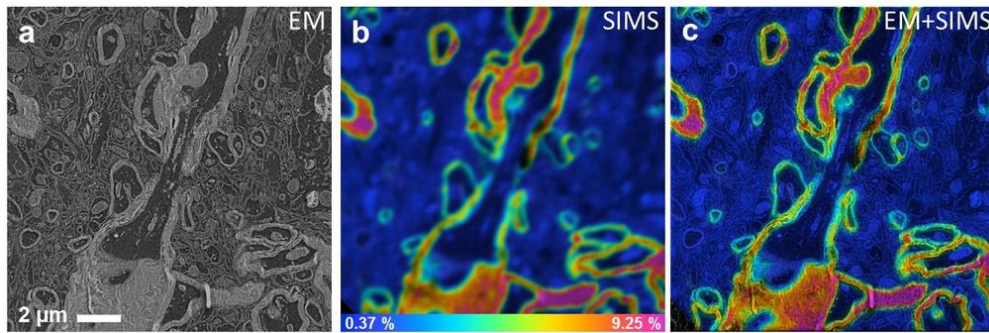


Data treatment and visualization for correlative microscopy

Co-registration and image fusion for correlative microscopy

To correlate the nanoscale details in structural images with the relatively lower resolution SIMS images, the two datasets need to be combined. For this purpose, image registration and fusion are often necessary. The as-acquired SIMS images are first processed using standard algorithms to correct any image distortions and image rotation with respect to the high-resolution structural images. Thereafter, two datasets are fused using image fusion methods. The image fusion methods are basically classified under two categories, pixel-domain fusion and frequency-domain fusion. Pixel-domain image fusion is relatively straightforward, but is prone to introduce image artefacts. Frequency-domain image fusion was found to be more robust and reliable for correlating different types of microscopy datasets (bright-field, dark-field) with the SIMS images. Our current activities include developing advanced algorithms and software for correlative image fusion and extending these methods towards 4D (3 spatial + 1 chemical) correlative microscopy.

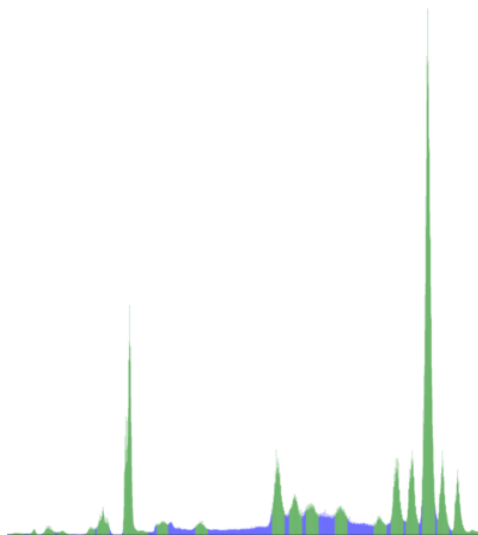


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Software and algorithms for automated data analysis

The newest generation of SIMS instruments produces larger amounts of data in less time than any generation before, making automated data processing a strong asset. Furthermore, data interpretation in SIMS requires a strong expertise, limiting its expansion. Automated data analysis allows overcoming this limitation, making the technique available to a larger community. To progress in this direction, we work on:

- new algorithms
- software and methods for data storage and sharing
- automated peak detection
- automated extraction of information from datasets
- etc.



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Linked Technologies

- [Instruments for correlative microscopy](#)
- [Instrumentation for nano-analytics](#)
- [Correlative methodologies and workflows in materials science and life sciences](#)
- [Particle - matter interactions for ion microscopy](#)

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