

Phase mapping, statistics and COMPASS

Keith Thompson

The advent of Spectral Imaging has opened the door to effective live-time and post-processing techniques for EDS. Central here is the ability to generate accurate elemental phase maps from the collected x-rays. The result has been a tidal wave of phase mapping techniques. These techniques range from classic RGB overlays, to “element-based phase maps” using Region of Interest data or, more recently, using fully quantified element maps. Alternate techniques apply spectral-only phase mapping, and some of the most advanced techniques employ principal component analysis in one form or another.

With this large diversity of phase mapping techniques provides options to the analyst, it begs many questions. How does each technique work? What are the advantages and disadvantages of each technique? How does one know the phase map was performed properly? Which technique is best for a given application? Is there a single best technique for all situations?

This vendor tutorial lifts the lid on phase mapping. We move through each technique in turn to discuss the pros and cons involved with each approach. We provide a concise yet thorough review of the applied statistics required for spectral-based phase mapping and reveal the unique insights that make these techniques either work very successfully or actually fail miserably.