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High-resolution X-ray Emission Spectroscopy as a Microprobe Imaging Modality[1] JOSEPH PACOLD, GERALD SEIDLER, BRIAN MATTERN, MATTHEW HAAVE, University of Washington, ROBERT GORDON, Simon Fraser University, University of Washington — Hard x-ray microprobe beamlines at third generation light sources have made significant impacts in several fields of science and technology. Such facilities permit rapid 2-dimensional studies of multiphase materials on submicron length scales using a variety of pixel-by-pixel imaging modalities (e.g., x-ray diffraction, x-ray absorption near edge fine structure, or x-ray fluorescence). Here, we aim to expand hard x-ray microprobe imaging modalities to include high-resolution x-ray emission spectroscopy (XES). When performed at 1-eV resolution, such measurements can provide quite direct atomic-level information on ionic valence, spin, and local electronic and chemical environment. Ongoing work in our research group has improved the efficiency of XES via the development of a new type of compact and inexpensive x-ray spectrometer design, the "miniature x-ray spectrometer" or "miniXS" paradigm. We will report preliminary 2-dimensional XES studies of planar multiphase materials, with specific applications to samples of interest for geophysics and catalysis science.

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