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Applications of Light Element X-ray Raman Spectroscopy and Hard X-ray Emission Spectroscopy to the Electronic Structure of Energy Storage Materials: Prospects and Initial Results from the Spectroscopy Program at SSRL DENNIS NORDLUND, WENG TSU-CHIEN, DIMOSTHENIS SOKARAS, SLAC National Accelerator Laboratory, STANFORD SYNCHROTRON RADIATION LABORATORY TEAM — We present the applicability of x-ray raman spectroscopy of light elements and hard x-ray emission to probe the electronic structure of energy storage materials under in-situ conditions. In particular, recent advances in resolution and throughput of x-ray raman spectroscopy (XRS) offer the capability to measure 1s x-ray absorption profiles of light elements such as lithium, boron, carbon, nitrogen and oxygen with less than 0.3eV resolution in the order of 10s of minutes. Initial results from the Spectroscopy program at SSRL and collaborations with groups in various energy storage fields will be presented, with an emphasis on Lithium Batteries and Hydrogen Storage applications.

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