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Agriculture research at the Advanced Photon Source: Current activities and future opportunities

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Synchrotron light sources have provided x-ray-based tools that supported a wide range of research in biological, geological, geochemical, and environmental sciences for decades. The ongoing generational upgrade of the Advanced Photon Source (APS) facility takes advantage of a new light source design, better instrumentation, and novel methods. When completed, the upgraded APS will be one of the world's brightest light sources, delivering x-rays up to 500 times brighter than today. The upgrade project also includes the building of new feature beamlines to make use of the increased brightness and coherence of the x-ray beams, and various enhancements to most of the existing beamlines. The high energy will allow users to probe unaltered large bulk samples with scientific relevance. The high brightness will provide macroscopic fields of view with nanometer resolution. The high coherence will enable highest spatial resolution even in most heterogeneity environment. All these characteristics will position the APS to be one of the best x-ray light sources for imaging applications, revolutionizing many scientific disciplines. This talk will provide an overview of the relevant research projects carried out at the APS in agriculture research and address future opportunities after the APS upgrade.

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