

# Surface science and material research using a two color beamline at Diamond Light Source

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Newly inaugurated in the Surface and Interface Village at Diamond Light Source in 2013, I09 is the first two-color beamline in the world that is designed to deliver both soft (down to 100 eV) and hard (up to 10+ keV) x-rays to the same spot using separate undulators and optics optimized for the two wavelengths. Such a wide photon energy range allows the users to apply multiple x-ray techniques to the same sample and thus enable them to correlate the atomic structures with the chemical and electronic properties. One can also benefit greatly from the possibility of switching between the two wavelengths to vary the information depth in probing the chemical compositions and electronic structures of thin films and buried interfaces. Such a beamline is therefore well suited for research in surface science and on material properties of novel systems. The first half of this talk will include a quick technical overview of the beamline, its recent applications to the studies of in-situ prepared 2-dimensional materials and molecular systems, and a brief discussion of the plans for its future development. The second half will focus on the hard x-ray photoelectron spectroscopy (HAXPES) activities at I09 on perovskite solar cell materials, manganite/cuprate superlattices and dilute magnetic semiconductors.