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Tuning the electronic properties of WS_2 on hBN by adatom engineering JYOTI KATOCH, The Ohio State University, SREN ULSTRUP, SIMON MOSER, ROLAND J. KOCH, Advanced Light Source, E.O. Lawrence Berkeley National Laboratory, KATHLEEN M. MCCREARY, Naval Research laboratory, Washington,D.C., SIMRANJEET SINGH, JINSONG XU, The Ohio State University, BEREND T. JONKER, Naval Research laboratory, Washington,D.C., ROLAND KAWAKAMI, The Ohio State University, AARON BOSTWICK, ELI ROTENBERG, CHRIS JOZWIAK, Advanced Light Source, E.O. Lawrence Berkeley National Laboratory — Among transition metal dichalogenides (TMDs), monolayer tungsten disulfide (WS_2) is gaining interest due to its large band gap, relatively high charge carrier mobilites and high spin-orbit coupling. The possibility to tune the electronic, optical and spin-valley related properties by substrate and adatom (e.g. alkali and heavy metal doping) engineering are one of the most interesting yet unexplored areas of research in the field of TMDs. Recently, we investigated the electronic band structure of monolayer WS_2 on h-BN by angle-resolved photoemission (ARPES). The 10μm sized spatial resolution of the μARPES endstation at the newly commissioned MAESTRO facility of the Advanced Light Source allowed us to identify these flakes and to obtain high quality band structure and core level information in a full spectro-microscopic approach. As particularly interesting finding we will discuss the effect of alkali and heavy metal doping on the spin-orbit coupling in the valence band of WS_2 on h-BN.

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