Spin-orbit dichroism in SX-ARPES of Pt(111)\(^1\) JUN MIYAWAKI, ASHISH CHAINANI, YASUTAKA TAKATA, MASAKI OURA, RIKEN SPring-8 Center, YASUNORI SENBA, HARUHIKO OHASHI, JASRI/SPring-8, SHIK SHIN, RIKEN SPring-8 Center, ISSP Univ. Tokyo — We study the bulk electronic structure of Pt(111) using polarization dependent soft x-ray (SX)-ARPES (\(h\nu = 450–610\) eV). Pt is known to exhibit the largest spin Hall conductivity of all metals, which is derived from its large spin orbit coupling [1,2]. We have measured band dispersions along \(\Gamma-K-X\) (\(h\nu = 466\) eV) with clockwise and counterclockwise circularly polarized x-rays and obtained circular dichroism (CD) in the valence band of Pt. A comparison with calculated band dispersions including spin-orbit coupling gives a very good match with the experimental results [3,4], thus establishing the role of spin-orbit coupling in the electronic structure of Pt. Our results also identify (i) a hybridization gap with symmetry switching dichroism and (ii) strong CD of bands at the Fermi level, which provide the carriers responsible for SHE.


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