

Abstract Submitted  
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**Direct observation of non-equivalent valley in WSe<sub>2</sub> by ARPES with circularly polarized light.** SOOHYUN CHO, Yonsei University, ibs-cces, GARAM HAN, JONKWEN JUNG, JIN-HONG PARK, Seoul National University, SEUNG RYONG PARK, Inchoen National University, CHANGYOUNG KIM, Seoul National University — Monolayer WSe<sub>2</sub> has spin band splitting at K point and non-equivalent valley which make it a good candidate for several applications such as valleytronic devices. Topological transport phenomena induced by valley Hall effect is supported by Berry's phase. Recently theoretical predictions indicated that Bloch electrons of monolayer WSe<sub>2</sub> with broken inversion symmetry carry opposite sign of Berry's curvature between K and -K valley. It was recently reported that nontrivial Berry's phase of graphene was shown by Circular Dichroism pattern (CD-pattern) via ARPES with circular polarized light. To investigate Berry's curvature of WSe<sub>2</sub>, We performed CD-ARPES on 2H bulk WSe<sub>2</sub> from the K(-K) to K(-K) point. Even though 2H bulk WSe<sub>2</sub> was measured on CD-pattern, its CD-pattern was analogous to monolayer WSe<sub>2</sub> because of short probing depth. We argue that our results display on CD-pattern proportional to Berry's curvature in the momentum space and have anit-symmetry behavior with respect to gamma M line.

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