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Bloch-Siegert shift in monolayer WS2 EDBERT J. SIE, MIT, C. H. LUI, UC Riverside, YI-HSIEN LEE, NTHU, LIANG FU, JING KONG, NUH GEDIK, MIT — Coherent light-matter interaction can be used to manipulate the energy levels of atoms, molecules and solids. Under off-resonance photon driving in such systems, repulsion between photon-dressed (Floquet) states can lead to a shift of energy resonance. The dominant effect is the optical Stark shift, but there is an additional contribution from the so-called Bloch-Siegert shift. Although it is common in atoms, the observation of Bloch-Siegert shift in solids has so far been limited only to artificial atoms since the shifts were tiny and inseparable from the optical Stark shift. Here we observe an exceptionally large Bloch-Siegert shift in monolayer WS2 by virtue of the strong light-matter interaction in this system. Moreover, the Bloch-Siegert shift can be separated entirely from the optical Stark shift by breaking time-reversal symmetry.

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