## Electronic supporting information for paper

## Magnetic-field-induced energy bandgap reduction of a perovskite by spin-orbit coupling

## via a low strength magnet

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Figure S1. Curve of magnetic strength vs distance from the magnet cube surface and its linear fit



Figure S2. Schematic illustration of (a) the PL measurement with an external magnetic field, and (b) the conductivity measurement.



Figure S3. XRD diffraction pattern of CsPbBr<sub>3</sub> for the confirmation of the material



Figure S4. XRD diffraction pattern of MAPbI<sub>3</sub> for the confirmation of the material



Figure S5. Super large grains of CsPbBr<sub>3</sub>.



Figure S6. Clustered  $KZnF_3$  cubes under SEM



Figure S7. Morphology of MAPbI<sub>3</sub>.



Figure S8. Nanosized grain of KMnF3 film deposited by sputtering