

Supplementary Information for

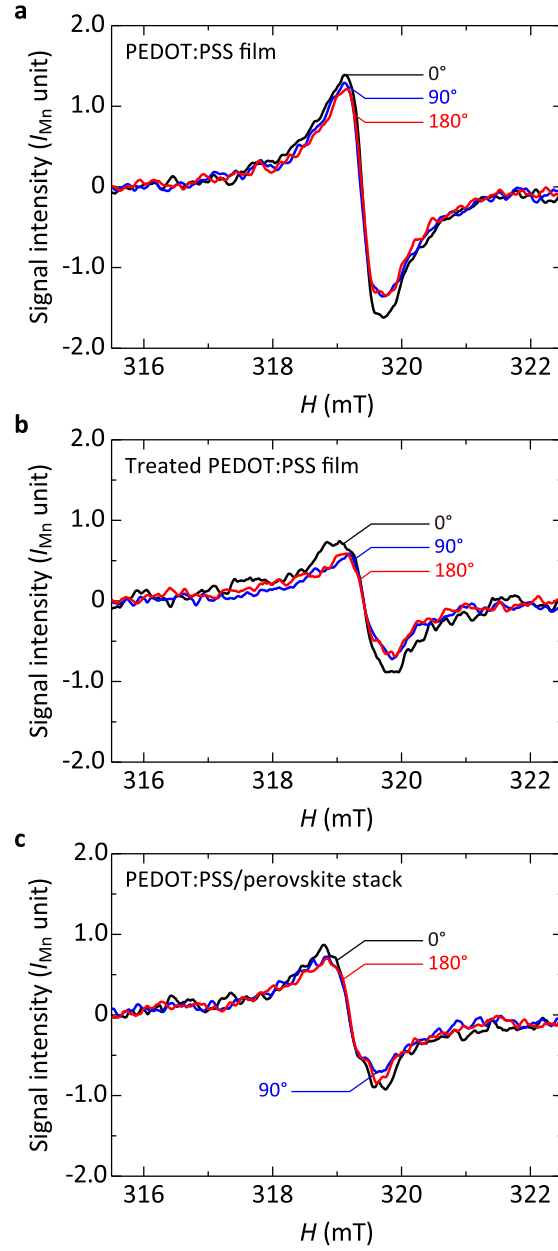
**Open-circuit-voltage improvement mechanisms in inverted
perovskite solar cells during operation revealed by electron-
spin observation**

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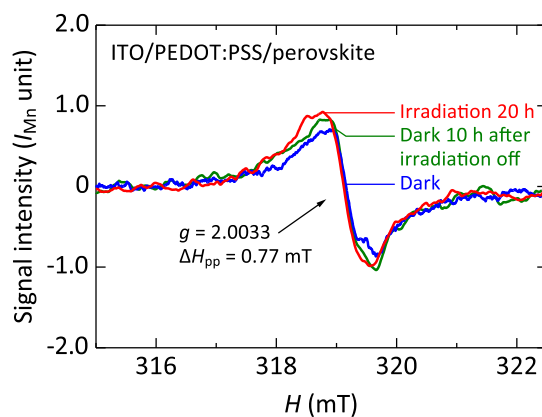
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S1. Anisotropy of g -factors



Supplementary Figure 1 | Anisotropy of g -factors of PEDOT:PSS films. Angular dependence of ESR spectra of **a**, as-fabricated PEDOT:PSS film, **b**, treated PEDOT:PSS film, and **c**, PEDOT:PSS/perovskite stack. The angles indicated here are angles between the external magnetic field to the substrate plane.

S2. ESR spectra of an ITO/PEDOT:PSS/perovskite stack under simulated solar irradiation



Supplementary Figure 2 | ESR spectra of an ITO/PEDOT:PSS/perovskite stack under simulated solar irradiation.