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Electric field induced octahedral rotation and its controllability WONSHIK KYUNG, Advanced Light Sources, CHOONGHYUN KIM, Seoul National University, YEONGKWAN KIM, Korea Advanced Institute of Science and Technology, BEOMYOUNG KIM, CHUL KIM, Yonsei University, WOUBEEN JUNG, JUNYOUNG KWON, Seoul National University, YOSHIYUKI YOSHIDA, Advanced Industrial Science and Technology, JONATHAN DENLINGER, AARON BOSTWICK, Advanced Light Sources, CHANGYOUNG KIM, Seoul National University — So far, octahedral rotation (OR) in perovskite materials have been believed to have strong importance because of their intimate connection with the material's physical properties. For instance, crystal symmetry change driven by OR sometimes cause metal-insulator transition or exotic orbital selective phenomena. Moreover, it is widely known that OR angle usually plays a significant role to determine each material's magnetic ground state through super-exchange and Dzyloshinskii-Moriya interaction. In this sense, controlling OR angle is one of the most promising techniques to design functional materials. Here, we report a clear evidence that OR can be tuned with the variation of electric field. With the help of competition between surface electric field and screening effects coming from adsorbed K atoms, we observed electric field strength dependent OR angle variation by measuring electronic structure of Sr₂RuO₄. Our finding reveals that electric field is one of the prominent parameters to determine OR angle even in the non-piezoelectric Sr₂RuO₄.

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