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Energy scales revealed by ARPES study on four layered cuprate superconductor $Ba_2Ca_3Cu_4O_8(O_\delta F_{1-\delta})_2$ YULIN CHEN, Stanford University, AKIRA IYO, AIST, Japan, WANLI YANG, XINGJIANG ZHOU, WEISHENG LEE, WORAWAT MEEVASANA, DONGHUI LU, Stanford University, HIROSHI EISAKI, AIST, Japan, OLE ANDERSEN, Max-Plank Institute, Germany, THOMAS DEVEREAUX, University of Waterloo, Canada, ZAHID HUSSAIN, Advanced Light Source, LBNL, ZHI-XUN SHEN, Stanford University, ZHI-XUN SHEN TEAM, AKIRA IYO COLLABORATION, OLE K. ANDERSEN COLLABORATION, THOMAS P. DEVEREAUX COLLABORATION, ZAHID HUSSAIN COLLABORATION — Recently discovered four layered cuprate superconductor $Ba_2Ca_3Cu_4O_8(O_\delta F_{1-\delta})_2$ posseses various properties that differ from the conventional cuprate High T_c superconductors, making itself exceptional to the well known high T_c superconductivity phase diagram. The understanding of this discrepancy will provide important implications for high T_c theory. We study this material by Angular Resolved Photoemission Spectroscopy (ARPES) and find that the electronic band structure of this four layered system exhibits clear difference from the previously studied hole- or electron- doped cuprate superconductors such as Bi2212 or NCCO. The multiple energy scales associated with its electronic structures not only show the complexity of this system, but also provide hints to understand its uniqueness.

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