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ARPES study on four layered superconductor compound Ba₂Ca₃Cu₄O₈(O,F)₂ (F0234) YULIN CHEN, Physics Department, Stanford University, WANLI YANG, Department of Applied Physics, Stanford University and Advanced Light Source, Lawrence Berkeley National Laboratory, XINGJIANG ZHOU, Stanford Synchrotron Radiation Laboratory and Advanced Light Source, Lawrence Berkeley National Laboratory, DONGHUI LU, Stanford Synchrotron Radiation Laboratory, AKIRA IYO, HIROSHI EISAKI, National Institute of Advanced Industrial Science and Technology, Japan, ZAHID HUSSAIN, Advanced Light Source, Lawrence Berkeley National Laboratory, ZHIXUN SHEN, Department of Physics, Applied Physics and Stanford Synchrotron Radiation Laboratory, Stanford University — An interesting phenomenon found in several families of cuprate superconductors is that with the increase of the number of CuO₂ layers (that are believed to be responsible for the superconducting phenomenon) within a unit cell of the crystal, the T_c increase first with the layer number n when n≤3, then decrease when n>3 and reach the maximum at n=3. To understand this, we use the Angular Resolved Photoemission Spectroscopy (ARPES) to study the four layered cuprate superconductor F0234 and compare the results with results from compounds with less layers. We found that the electronic band structure of the four layered system exhibits clear difference from the previously studied cuprate superconductors with less layers. These results provide new insights on the nature of cuprate physics.

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