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ARPES investigation of two leg ladder compounds $Sr_{14-x}Ca_xCu_{24}O_{41}$ GEY-HONG GWEON, UC Santa Cruz, TAKAO SASAGAWA, Tokyo Institute of Technology, TAKAMI TOHYAMA, Yukawa Institute for Theoretical Physics, MATTHEW BRUNNER, JAMES HINTON, JACOB STANLEY, UC Santa Cruz — The so-called "two leg ladder compounds" $Sr_{14-x}Ca_xCu_{24}O_{41}$ are interesting since it is well accepted that they form a resonating valence bond state. The crystal structure of two leg ladder compounds consists of one-dimensional motifs (ladders and chains), and it is within the ladders that the resonating valence bond state arises. As x is varied, these compounds go through a metal-insulator transition, and become a superconductor, albeit under pressure. So far, a high resolution ARPES study shedding light on the near-Fermi-level electronic structure of these interesting compounds has been missing. Here, we report our ARPES results, providing the first view of the near-Fermi-level quasi-one-dimensional electronic structure arising from the ladders. We discuss line shape features that are indicative of strong electron correlations.

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