Metal-insulator transition in La$_{2-2x}$Sr$_{1+2x}$Mn$_2$O$_7$ ($x=0.59$) revealed by ARPES ZHE SUN, J. F. DOUGLAS, Q. WANG, University of Colorado at Boulder, A. FEDOROV, Y. -D. CHUANG, Advanced Light Source, Lawrence Berkeley National Laboratory, H. ZHENG, J. F. MITCHELL, Argonne National Laboratory, D. S. DESSAU, University of Colorado at Boulder — Using angle-resolved photoemission spectroscopy (ARPES), we studied the metal-insulator transition of La$_{2-2x}$Sr$_{1+2x}$Mn$_2$O$_7$ ($x=0.59$). Below $T_C$, there is significant metallic weight at the Fermi level, while a gap opens above $T_C$, in excellent agreement with resistivity measurements. We also found that in this compound the metal-insulator transition is associated with a remarkable coherent-incoherent weight transfer from the dispersive band to a non-dispersive feature over a large energy scale. The band dispersion also shows an unusual change with increasing temperature, suggesting complicated interactions in this material.

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