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**Novel Josephson junctions of high- $T_c$  cuprate using magnetic islands: Fabrication and Properties** A. MAEDA, L. GOMEZ, S. KITAMURA, Department of Basic Sciences, University of Tokyo — In spite of the potential high performance, no one has succeeded in fabricating good Josephson junctions of high- $T_c$  cuprate superconductors with a large  $I_c R_N$  product and textbook like  $I - V$  characteristics. This is probably because the fabrications of the oxide barrier layer even on the almost perfect surface of the cuprate causes many unexpected troubles, suggesting that there are still many issues to be solved in the surface science of the cuprate superconductors. We have tried the high- $T_c$  Junction fabrication with a novel method, where we do not need to fabricate oxide barrier layer; A small island of Fe was merely placed on a strip of a cuprate superconductor, LSCO. By measuring  $I - V$  characteristics, microwave radiation effect, and magnetic field effect, it turned out that this simple novel structure becomes a typical Josephson junction. What is remarkable is that the structure often exhibits a large  $I_c R_N$  value ( $\sim 10$ - $20$  meV), suggesting that our method is promising. Together with various kinds of comparative experiments, we will discuss the mechanism of the weak coupling.

Atsutaka Maeda  
Dep. Basic Sci., University of Tokyo

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