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Symposium **Title:** High-Temperature Superconductors--Material and Fabrication Issues for Applications.

**All Epitaxial Edge-geometry SNS Devices with Doped PBCO and YBCO Normal Layers\***. *J. B. Burner, B.D. Hunt and M. C. Foote, Center for Space Microelectronics Technology, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA.* We will present our results on tapered-edge-geometry SNS weak links fabricated from c-axis oriented base-, counterelectrode and normal layers using a variety of processing conditions. To date, we have employed a variety of different normal materials (Co-doped YBCO, Y-doped PBCO, Ca-doped PBCO). We have been examining the junction fabrication process in detail and we will present our methods. In particular, we have been examining both epitaxial and non-epitaxial milling mask over-layers and we will present a comparison of both methods. These devices behave similar to the expectations of the resistively-shunted junction model and conventional SNS proximity effect models but with some differences which will be discussed. We observe an exponential decay of the critical current density with increasing barrier thickness for all the various normal-layer materials. However, the Co-doped YBCO and, under certain conditions, PBCO barrier junctions show an exponential increase in current density with decreasing temperature, as expected by classical proximity effects. We will present the detailed systematics of our junctions including device parameters versus temperature, rf and dc magnetic field response for the various processing conditions.

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