

**High Current RF Shield for PEP-II Vacuum System Expansion Joint**<sup>\*</sup>, C. BELSER, J. BERG, J. KERNS, M. MCDANIEL, M. MUGGE, W. STOEFFL, LLNL; A. KULIKOV, U. WIENANDS, SLAC<sup>\*\*</sup> - We describe the development of a novel RF shield for the circular expansion joint used throughout the PEP-II vacuum system straight sections. Existing RF shield designs, used in accelerators/storage rings throughout the world, have been the source of many failures at beam currents much smaller than the 3 amps planned for PEP-II. Our RF shield uses a unique spring-loaded finger mechanism to maintain proper electrical contact across the joint, accommodate 1.5 mm transverse and 32 mm longitudinal excursions, while minimizing geometry-driven trapped-mode RF heating at GHz frequencies. Alumina-dispersed, copper alloy fingers are used to maintain desired mechanical properties at higher temperatures instead of the more commonly used beryllium-copper alloys. A prototype expansion joint was assembled, mechanically tested, and subjected to 200% of the expected RF load induced in the finger mechanism. This RF shield design can be easily adapted to non-circular geometries.

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