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ON THE COVER: The photograph shows an arrangement of aluminum rings, 1.5 μm in diameter, used to study magnetic interactions in superconducting arrays. The rings are placed on a Kagomè lattice, each ring having four nearest neighbors. The structure was fabricated for Daniel Reich and Grigoriy Davidovich of the Department of Physics and Astronomy at Johns Hopkins University by Richard Tiberio at the National Fabrication Facility at Cornell University. Photo courtesy of Bob Richardson.

12:00

B22 6 Noise Characteristics Below 1 Hz of Zener Diode-Based Voltage References ALAN F. CLARK, RICHARD L. STEINER, *NIST, Gaithersburg, MD 20899* — The short- and mid-term noise of voltage references based on Zener diodes are the limiting factors in the accuracy of their application as voltage standards. Although these references are relatively rugged, survive the rigors of shipping, and have predictable long-term behavior, they do have noise in the voltage output values with a time dependence about the same as the desired measurement intervals. We have characterized several of these references in the frequency range of 10^{-1} to 10^{-6} Hz (time intervals of seconds to months) by direct comparison to a Josephson array voltage standard at the 10 and 1 volt level with nanovolt precision. Several distinctly different regions of noise characteristics are observed. Comparisons are made with $1/f$ and other expected behaviors and resulting accuracy limitations discussed.