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Hyunchul Park* (hpark02@wm.edu), Hugh Jones Hall 132, Department of Mathematics, The College of William and Mary, Williamsburg, VA 23187, and **Renming Song**. *Trace estimates for relativistic stable processes.*

In 1966, Mark Kac asked if one could hear the shape of a drum. This means if one can figure out the geometry of the domain (drum) when one has perfect pitch so that he or she can hear all the fundamental tones (eigenvalues of the Laplacian or Brownian motions) of that drum. This turns out to be false. There exist isospectral but not isometric domains but one can still extract important geometric information such as area, perimeter, or even the Euler Characteristic from the eigenvalues of Dirichlet Laplacian of the domain.

A very natural question is what happens when we replace Brownian motions by other Levy processes. Relativistic stable processes (RSP) are pure jump Levy processes whose jump rate is similar to stable processes for a small scale but have an exponential decay for a large scale. In a recent work with Song, we prove that one can identify area and perimeter of the domain from the information of eigenvalues of RSP. (Received September 11, 2013)