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William O. Bray* (bray@math.umaine.edu), Department of Mathematics and Statistics, 333 Neville Hall, University of Maine, Orono, ME 04469. *Variations on the Riemann-Lebesgue Lemma*. Preliminary report.

The classical Riemann-Lebesgue lemma states that for $f \in L^1(T)$, $T = \text{circle group}$, the Fourier coefficients $\{\widehat{f}(n)\}$ are a null sequence. One classical proof of this result is embodied in the estimate

$$|\widehat{f}(n)| \leq \frac{1}{4\pi} \int_{-\pi}^{\pi} |f(t + \pi/n) - f(t)| dt.$$

This estimate represents a quantitative Riemann-Lebesgue lemma by providing a gauge on the size of the Fourier coefficients. The focus of this talk is to provide quantitative estimates for the Fourier transform of L^p -functions ($1 \leq p < 2$) on rank one symmetric spaces of non-compact type. Our results are akin to those of Gioev [to appear, Contemp. Math] and Cline [JMAA 159 (1991)] on Euclidean space. This work is part of a joint project with Mark A. Pinsky. (Received January 23, 2008)