



An Introduction to the Uncertainty Principle: Hardy S Theorem on Lie Groups

By Sundaram Thangavelu

Birkhauser. Paperback. Condition: New. 174 pages. Dimensions: 9.2in. x 6.1in. x 0.5in. In 1932 Norbert Wiener gave a series of lectures on Fourier analysis at the University of Cambridge. One result of Wiener's visit to Cambridge was his well-known text *The Fourier Integral and Certain of its Applications*; another was a paper by G. H. Hardy in the 1933 *Journal of the London Mathematical Society*. As Hardy says in the introduction to this paper, This note originates from a remark of Prof. N. Wiener, to the effect that a f and g cannot both be very small. . . . The pair of transforms which follow give the most precise interpretation possible of Wiener's remark. Hardy's own statement of his results, lightly paraphrased, is as follows, in which f is an integrable function on the real line and f is its Fourier transform: $x^{-m} |f(x)|^2$ and $|g(x)|^2$ are both $O(x^{-2m})$ for large x and some m , then each is a finite linear combination of Hermite functions. In particular, if f and g are both $O(x^{-m})$, then $\int |f(x)|^2 dx \leq A \int |g(x)|^2 dx$, where A is a constant; and if one $x \rightarrow \infty$...

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