GABOR FRAMES GENERATED BY RANDOM-PERIODIC TIME-FREQUENCY SHIFTS

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we consider a variation of the existence of Gabor frames in a probabilistic setting, in which we consider time-frequency shifts taken over random-periodic sets. We demonstrate that the method of selecting random-periodic time-frequency shifts is successful with high probability for specific categories of well-behaved functions, notably including Hermite functions, totally positive functions, and B-spline functions. In particular, we show that if $x_1, x_2, \ldots, x_m$ are independent and uniformly distributed in $[0, 1)$, with m sufficiently large, then the set of time-frequency shifts $\Lambda \times \mathbb{Z}$, where $\Lambda = \mathbb{Z} + \{x_1, x_2, \ldots, x_m\}$, forms Gabor frame with high probability.