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S. Zubin Gautam* (sgautam@math.ucla.edu), Department of Mathematics, UCLA, Box 951555, Los Angeles, CA 90095-1555. *A critical-exponent Balian-Low theorem.*

We prove an uncertainty principle for Gabor systems that generalizes the classical Balian-Low theorem. Namely, if f belongs to the Sobolev space $H^{p/2}(\mathbb{R})$ with Fourier transform $\hat{f} \in H^{q/2}(\mathbb{R})$, $\frac{1}{p} + \frac{1}{q} = 1$, then the Gabor system of modulates and translates of f associated to $\mathbb{Z} \times \mathbb{Z}$ is not a frame for $L^2(\mathbb{R})$. (Received February 10, 2008)