Violation of Cauchy-Schwarz inequalities by spontaneous Hawking radiation in resonant boson structures[1] FERNANDO SOLS, JUAN R.M. DE NOVA, IVAR ZAPATA, Universidad Complutense de Madrid — The violation of a classical Cauchy-Schwarz (CS) inequality is identified as an unequivocal signature of spontaneous Hawking radiation in sonic black holes. This violation can be particularly large near the peaks in the radiation spectrum emitted from a resonant boson structure forming a sonic horizon. As a function of the frequency-dependent Hawking radiation intensity, we analyze the degree of CS violation and the maximum violation temperature for a double barrier structure separating two regions of subsonic and supersonic condensate flow. We also consider the case where the resonant sonic horizon is produced by a space-dependent contact interaction. In some cases, CS violation can be observed by direct atom counting in a time-of-flight experiment. We show that near the conventional zero-frequency radiation peak, the decisive CS violation cannot occur.

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