

Abstract Submitted
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Dependence of Johnson Noise on Resistance and Noise Density R.

SETH SMITH, CHACE COVINGTON, Francis Marion University — Johnson noise is electronic noise generated from a nonzero emf in resistors due to a thermodynamic connection between heat dissipation and fluctuations. While the average emf in resistors is zero, the value fluctuates around zero, creating noise that interferes with signals that one can measure from the circuit. A TeachSpin Noise Fundamentals apparatus was used to measure Johnson noise and explore its characteristics. Johnson noise was analyzed as a function of resistance by inserting different resistances into a circuit. By adjusting the bandwidth of an electrical signal, Johnson noise was also analyzed as a function of noise density and the results were used to measure a value for Boltzmann's constant. The experimental setup will be described, and the results will be presented.

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