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Automated temperature measurement in an optical tweezers system ALEXANDER MANDARINO, SAMUEL V. MIGIRDITCH, TYLER W. FOLEY, BROOKE HESTER, Appalachian State University — An optical tweezers system uses highly focused laser radiation in order to confine small particles and typically are used to study biological systems or materials. The measurement of the trap stiffness can be completed through various calibration techniques. Many calibration methods require an accurate knowledge of particle size, fluid viscosity, and temperature. We present an automated method for high-frequency power spectral analysis of thermal motion position data to find the temperature of the particle in the optical trap. The implementation of this method of temperature measurement allows for a more accurate determination of trap stiffness in the automation program.

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