

Power Measurement of Large Laser Beams with a Small Dual-Cone Calorimeter

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MEASUREMENTS of the power or energy in laser beams of large cross section can be made with small commercially available dual-cone calorimeters¹ by using sampling techniques, provided the calorimeters are used as intended. The reference cone is intended to compensate for ambient conditions but this cone must obviously be covered for sampling large beams. Since both the reference and input cones sense radiation incident on the front surface of the calorimeter, the method of covering the cone may cause an error in the measurement. Covering the half of the front surface containing the reference cone prevents compensation by this cone for the energy incident on the surface around the input cone. We have investigated the magnitude of the error experimentally. We covered the lower

half of the front surface, including the reference cone, and just the opening of the input cone, so as to observe only the effect of radiation incident on the front surface surrounding the input cone. The response to 1.06 μ radiation was 3% of the response obtained when the input cone was uncovered. The error for other wavelengths may be different, since the surface may absorb more or less of the incident radiation.

The recommended technique is to provide an aperture which allows a sample of the beam to enter the input cone but prevents the beam from irradiating any part of the front surface of the calorimeter.

¹H. G. Heard, *Laser Parameter Measurements Handbook* (John Wiley & Sons, Inc., New York, 1968), p. 153.