Abstract Submitted
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Characteristics of the Lakeshore Wind Measured with an Ultrasonic Anemometer RICHARD STIMETS, UMass Lowell — Time series of wind speed, wind direction and wind elevation at an altitude of 1.5 m above ground level at a lakeshore site on a lake in Maine have been recorded using an ultrasonic anemometer at a sampling rate of 10 Hz. The data have been analyzed to compute power spectra, correlation spectra and distribution functions of the various quantities. The power spectra of wind speed and wind direction typically have peaks in the frequency range of 0.002 Hz to 0.05 Hz (500 s to 20 s period); those of wind elevation peak at higher frequencies. Power-law behavior is often observed in the high-frequency regime although the numerical value of the exponent is variable. When the wind blows steadily from the east-southeast (stormy weather) and west (fair weather) directions the distribution functions of both wind speed and direction are close to normal Gaussian distribution functions. When the wind blows gustily from the northwest, often following the passage of a cold front, the distribution function of wind direction is bimodal and the distribution functions of wind speed are clearly non-Gaussian and are better fit by a gamma distribution function.

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