



Variance methods for sensible surface heat flux determination at the earth surface

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Heat flux measurements are very important in the study of the atmospheric boundary layer (ABL) dynamics; heat flux controls ABL stability and is therefore crucial to various topics such as air quality and hydrometeorology. Accurate heat flux measurements can be obtained using the eddy covariance method which requires synchronized, high frequency, wind and temperature measurements. In the present study, two simpler methods for heat flux measurement, based on Monin-Obukhov similarity theory, are tested. The first method, called the variance method, consists of using the similarity equation of second moment of temperature. While the second method requires high frequency measurements of temperature and horizontal wind velocity. Data from two field experiments under stable and unstable atmospheric conditions are used to check the validity of these methods and compare their prediction to the eddy covariance method.