

# Profile Method

B1  
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## Assumptions

- Experiment carried out on homogeneous surface.
- Surface doesn't deform much with increasing wind speed.
- All variables are stationary.
- Heat flux is not too large
- (Near neutral stability – if assumed  $H = 35W m^{-2}$ )

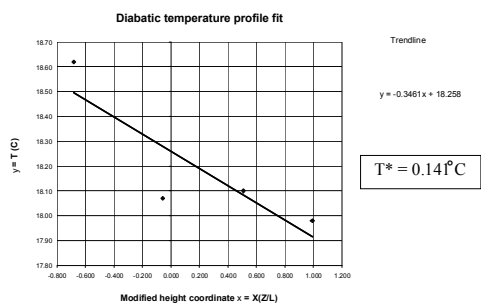
## Results

Parameters	B1 PRT	B1 Mercury	B2 PRT	B2 Mercury
$U^*$ (m/s)	0.302±0.010	0.307±0.010	0.263±0.010	0.277±0.010
$T^*$ (°C)	0.141±0.107	0.182±0.017	0.132	0.147±0.017
$H$ ( $W m^{-2}$ )	51.0±39.0	67.0±7.0	42.5	49.0±6.0
$\tau$ ( $N m^{-2}$ )	0.108±0.005	0.113±0.005	-	0.092±0.004
$L$ (m)	-48.0±37.0	-39.0±4.0	65.5	-39.0±5.0
$Ri$	-0.044	-0.106	-0.049	-0.129
$Z_0$ (m)	0.049±0.002	0.051±0.002	0.030±0.001	0.034±0.001
$T_{2.0}-T_{0.2}$ (°C)	-0.54±0.41	-0.94±0.09	-	-0.76±0.09

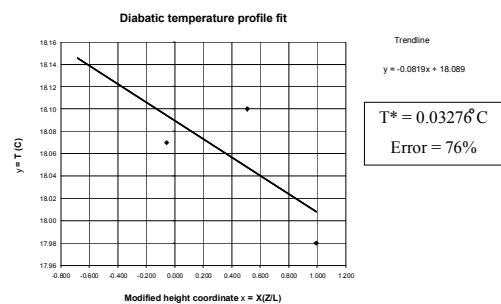
## Notes

- It would appear that B1's results of  $U^*$ ,  $\tau$  and  $Z_0$  were effected to a greater extent than B2's by the science centre down wind.
- The large uncertainties in some of B1's PRT results have originated from the calibration errors of 1% in the PRTs being amplified. These have been quantified by adjusting points on the temperature profile graphs.
- The two results for  $H$  in the mercury thermometer measurements do not over lap. For future measurements we would recommend using more thermometers as only 2 were used.
- Alternatively this error could have arisen from human errors in the calculation of  $H$ ; as this required 5 iterations of a relatively complex calculation.

## Original Temperature Profile



## $\theta_0$ Removed



# $\theta_0$ Reduced by 1%

