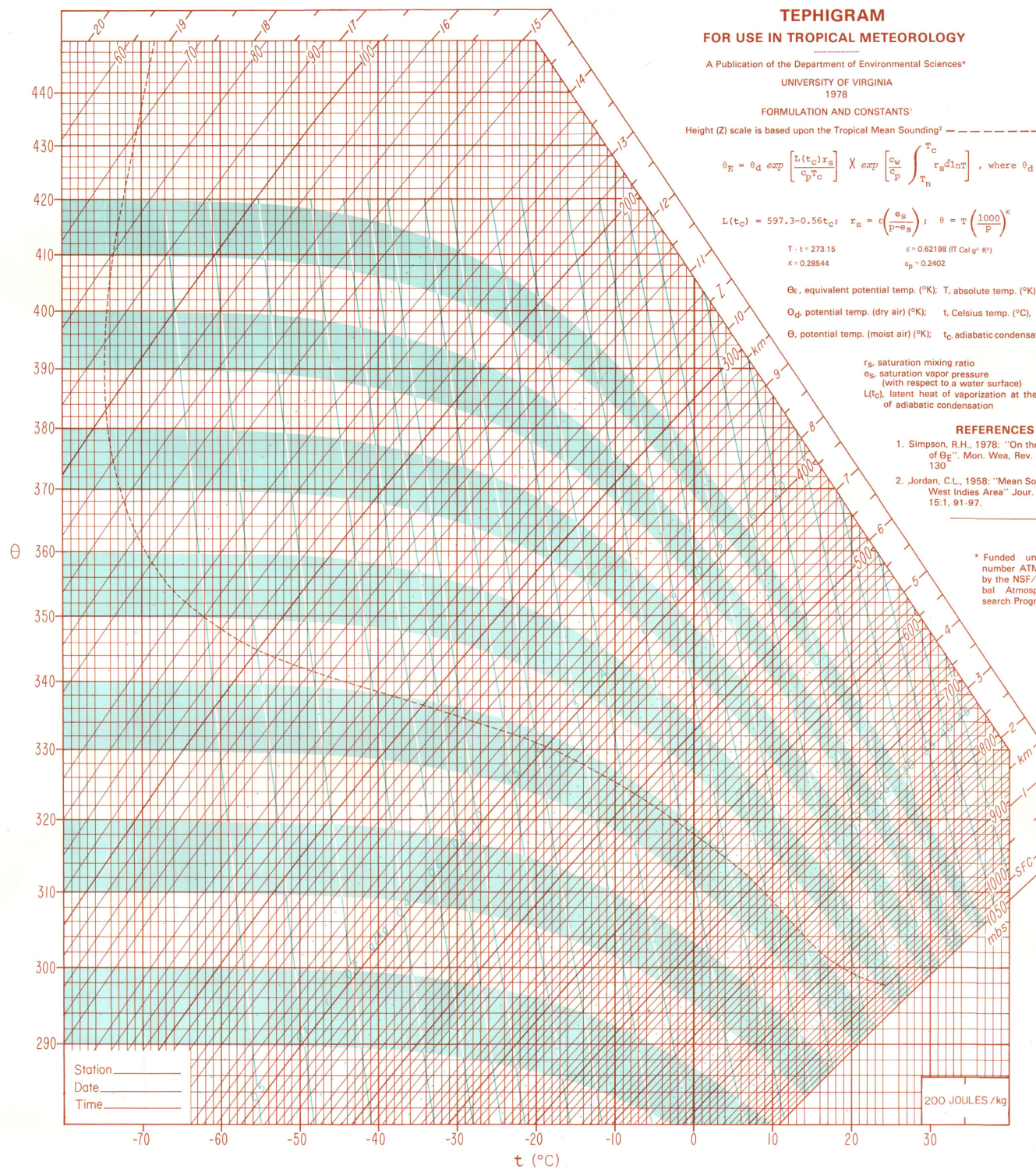




TEPHIGRAM FOR USE IN TROPICAL METEOROLOGY

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FORMULATION AND CONSTANTS

Height (Z) scale is based upon the Tropical Mean Sounding² -----

$$\theta_E = \theta_d \exp \left[\frac{L(t_c) r_s}{c_p T_c} \right] \times \exp \left[\frac{c_w}{c_p} \left(\frac{T_c}{T_n} \right) \right], \text{ where } \theta_d = T \left(\frac{1000}{p - e} \right)^K$$

$$L(t_c) = 597.3 - 0.56 t_c; \quad r_s = e \left(\frac{\theta_s}{p - \theta_s} \right); \quad \theta = T \left(\frac{1000}{p} \right)^K$$

$$T - t = 273.15$$

$$K = 0.28544$$

$$e = 0.62198 (T \text{ Cal g}^{-1} \text{ K}^{-1})$$

$$c_p = 0.2402$$

θ_e , equivalent potential temp. (°K); T , absolute temp. (°K)

θ_d , potential temp. (dry air) (°K); t , Celsius temp. (°C),

θ , potential temp. (moist air) (°K); t_c , adiabatic condensation temp. (°C),

r_s , saturation mixing ratio

e_s , saturation vapor pressure

(with respect to a water surface)

$L(t_c)$, latent heat of vaporization at the temperature

of adiabatic condensation

REFERENCES

1. Simpson, R.H., 1978: "On the computation of θ_E ". Mon. Wea. Rev. 106; pp. 124-130
2. Jordan, C.L., 1958: "Mean Sounding for the West Indies Area" Jour. Appl. Meteor. 15:1, 91-97.

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