

MASS DISTRIBUTION

For simplicity, the mass of erupted tephra is assumed to be uniformly distributed with height irrespective to particle size (see Figure 1). Both TEPHRA and TEPHRA2 have the option of choosing the plume fraction where the mass is distributed (i.e. the lower plume level where particles start being released).

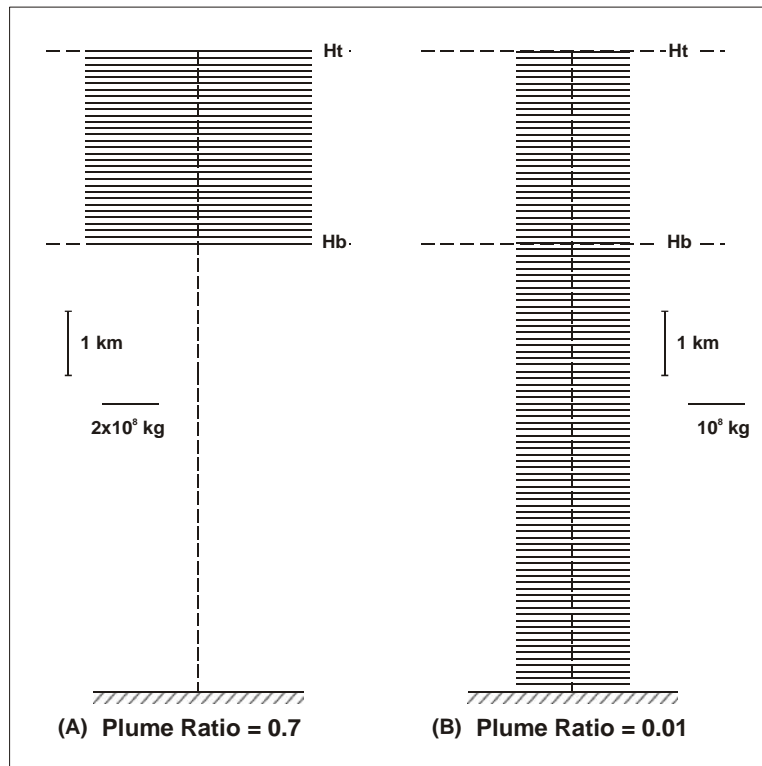


Fig. 1 Diagram showing the model of mass distribution used in TEPHRA2 for a plume with a height of 10km above the vent and a total erupted mass of 2×10^8 kg as an example. The source-point vertical spacing in this model is variable, and in this case it is set at 100m as an example.

The length of solid horizontal lines is proportional to the mass released at every plume step. The vertical dashed line indicates the plume centreline. The horizontal dashed lines indicate the top of the plume (Ht) and the neutral buoyancy level (Hb) as determined from Sparks *et al.* [1986].

(A) Mass distribution for a plume ratio = 0.7 (i.e. the base of the particle-release points coincides with the neutral buoyancy level)

(B) Mass distribution for a plume ratio = 0.01 (i.e. the particle-release points are uniformly distributed along the whole plume starting from the first 100m)

References

Carey, S., and H. Sigurdsson, The intensity of Plinian eruptions, *Bulletin of Volcanology*, 51, 28-40, 1989.

Sparks, R.S.J., The dimensions and dynamics of volcanic eruption columns, *Bulletin of Volcanology*, 48, 3-15, 1986.