Evaluation of eruption column height deduced from analysis of mass loading isopleth

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The method for estimation of eruption column height proposed by Carey and Sigurdsson (1986) based on the concept of 'clast support envelope' has been widely used by field geologists (hereafter, CSE method). This method is very popular owing to its simplicity; no need to vast sampling or complex calculation. However, this method uses 'maximum lithic diameter' which is problematical as a statistic parameter. Bursik et al. (1992) proposed alternative method using decay of mass loading per unit area (S) as a function of distance from the vent (r), based on their eruption column model. The author modified Bursik et al. (1992) and deduced a relation between S and isopleth area (A) enclosed by S, isopleths, provided distortion of isopleth shape by wind does not affect to its area (hereafter, SA method). Application of the theory to Izu-Oshima 1986 B eruption shows fair agreement with the observation (Mannen, submitted to JVGR. Mannen, 2005). In this study, column heights calculated by CEA and SA methods are compared for three eruptions. These eruptions are Taupo (Taupo, NZ), Chuseri and Nambu (Towada, Japan). In each eruption, heights obtained by the two methods show quite agreement; Taupo (51km by CSE - 52km by SA), Chuseri (29km-29km) and Nambu (25km-32km).