

DUST STORM CONTRIBUTIONS TO AIRBORNE PARTICULATE MATTER IN REYKJAVÍK, ICELAND

FIGURES

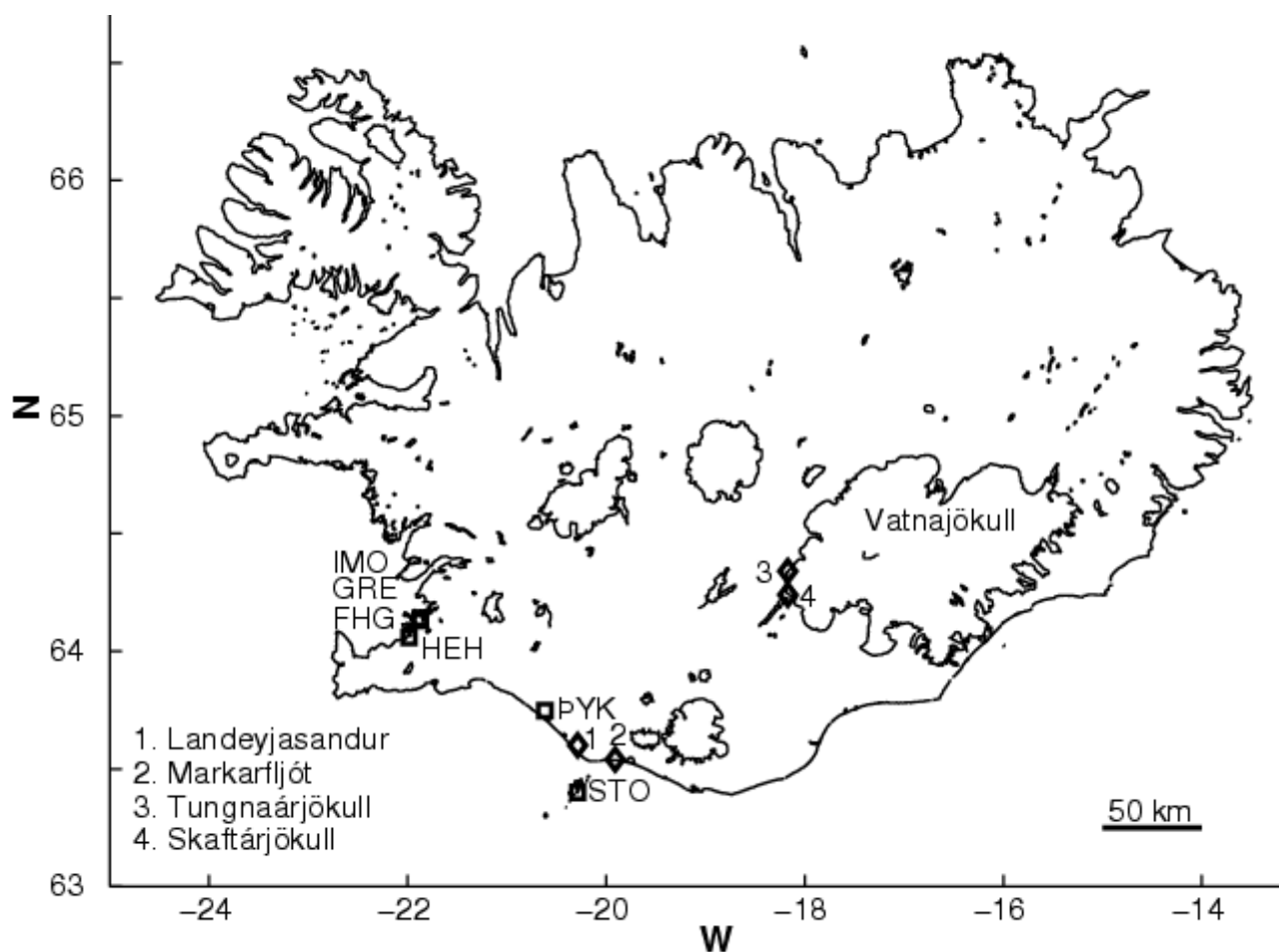


Figure 1. Map of Iceland showing the location of PM₁₀ measurement stations in the Reykjavík area, GRE, FHG and HEH, and the weather stations used IMO (Reykjavík), PYK and STO in this study. Locations mentioned in the text are indicated.

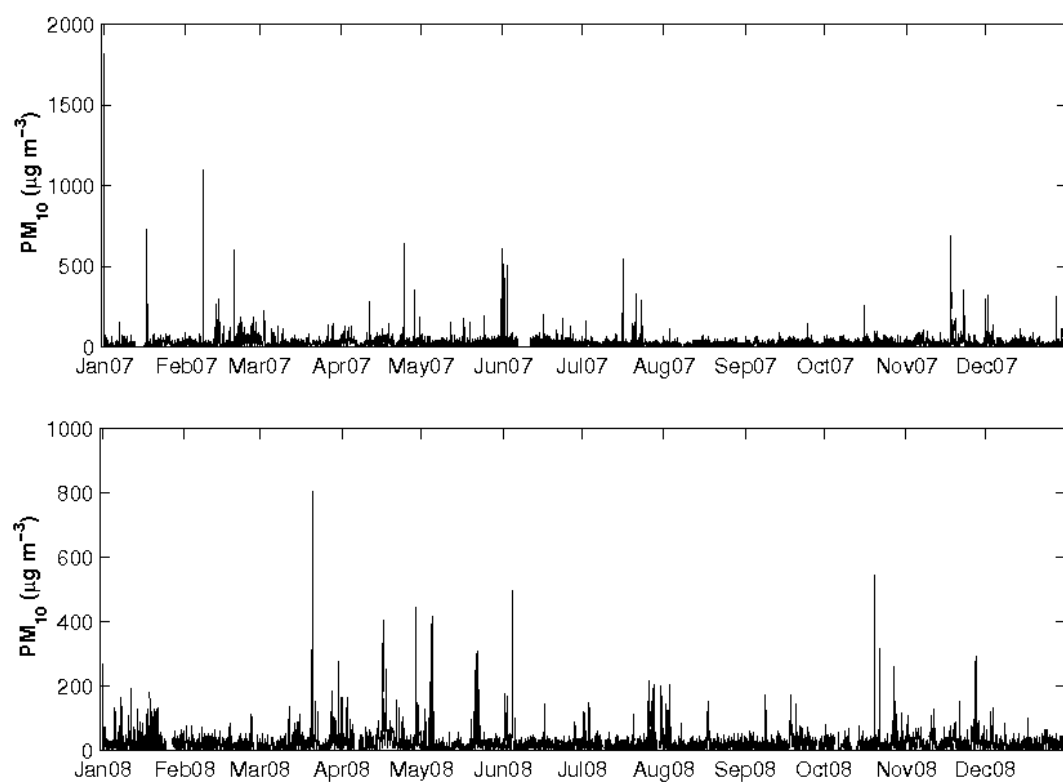


Figure 2. PM₁₀ pollution levels at GRE-station for the years 2007 and 2008 (30-min values).

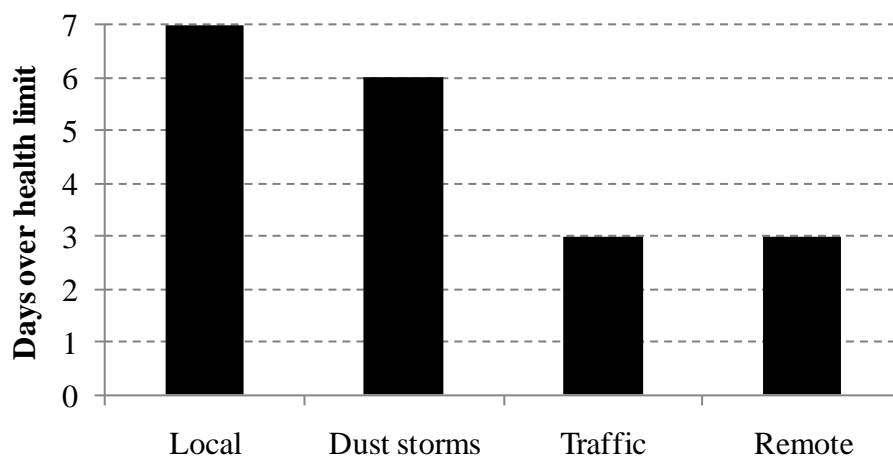


Figure 3. Sources of PM₁₀ material during days that exceeded the health limit in 2008 at GRE-station.

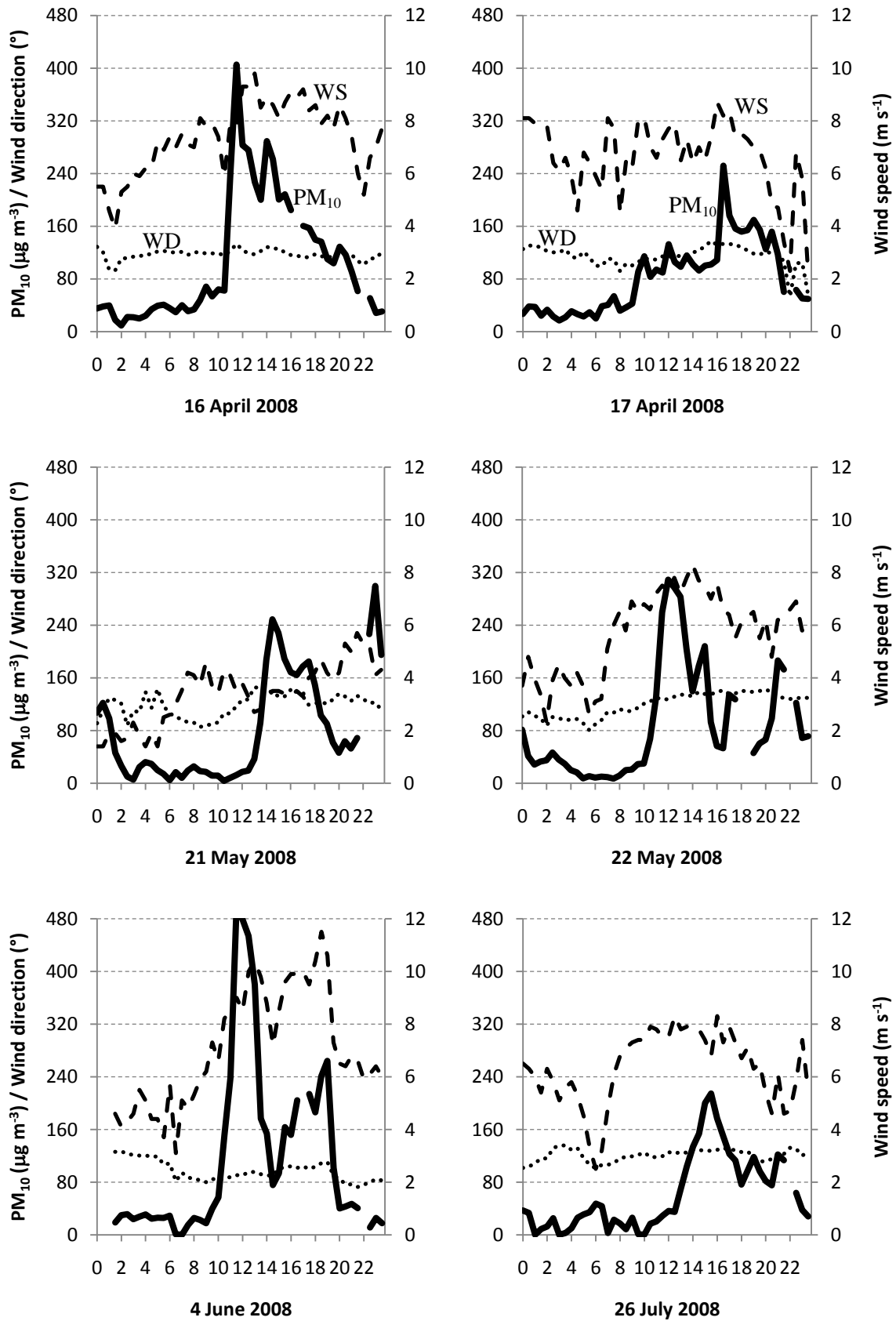


Figure 4. PM_{10} (thick lines), wind speed (dashed lines) and wind direction (dotted lines) measured at the GRE-station during days of dust storms in 2008.

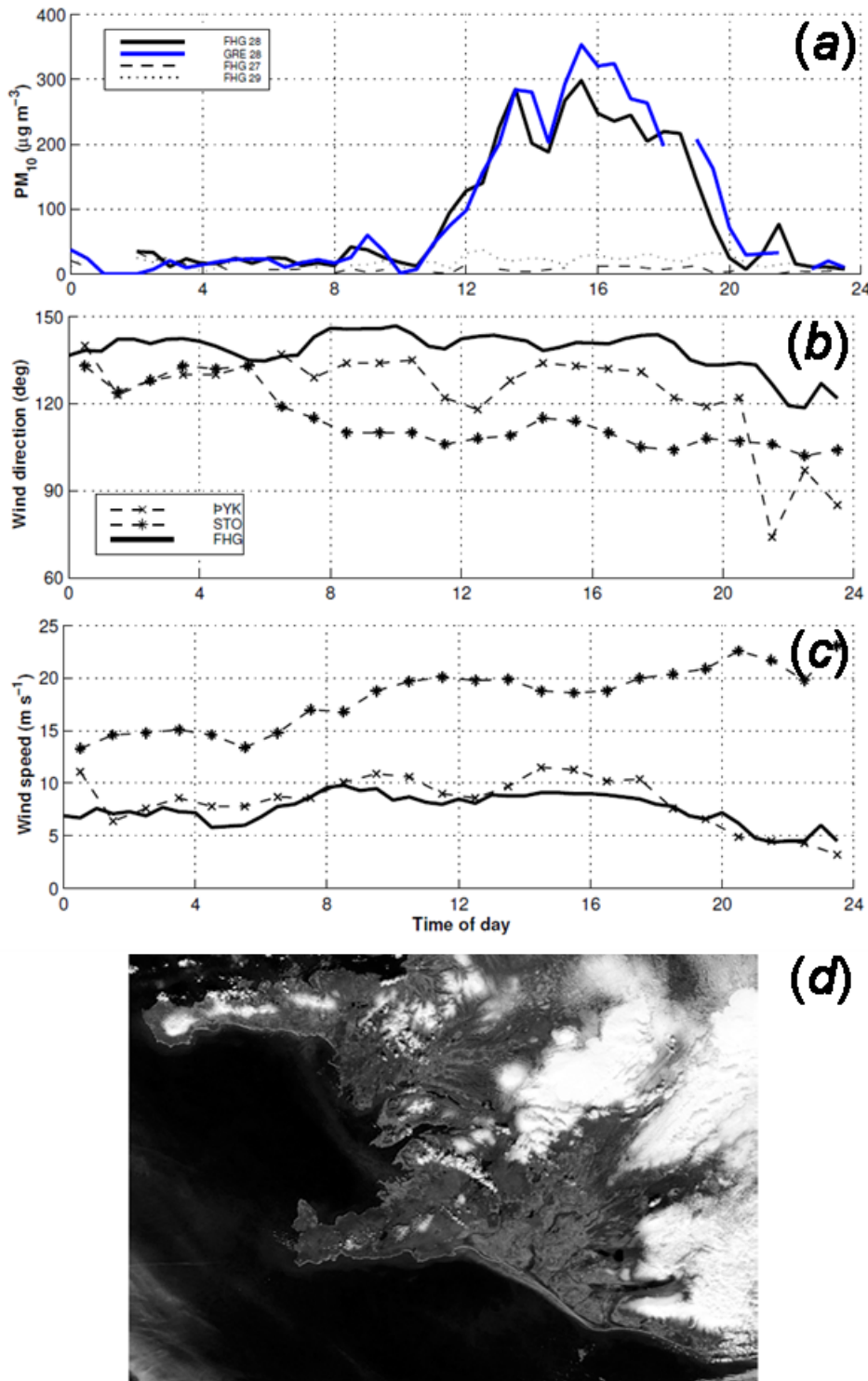


Figure 5. Summary data for dust event on 28 April, 2007. (a) PM₁₀ (30-min values) measured at FHG (April 27 – 29) and GRE, (b) wind direction and (c) wind speed measured on April 28, 2007 at FHG (solid line), STO (star-dashed line), and PYK (x-dashed line). (d) MODIS Aqua image 13:45 (local time) showing dust blowing from Landeyjasandur and Markarfljót (on the coast just north of STO; Fig. 1) towards Reykjavík on April 28, 2007. Image courtesy of MODIS Rapid Response System at NASA/GSFC.

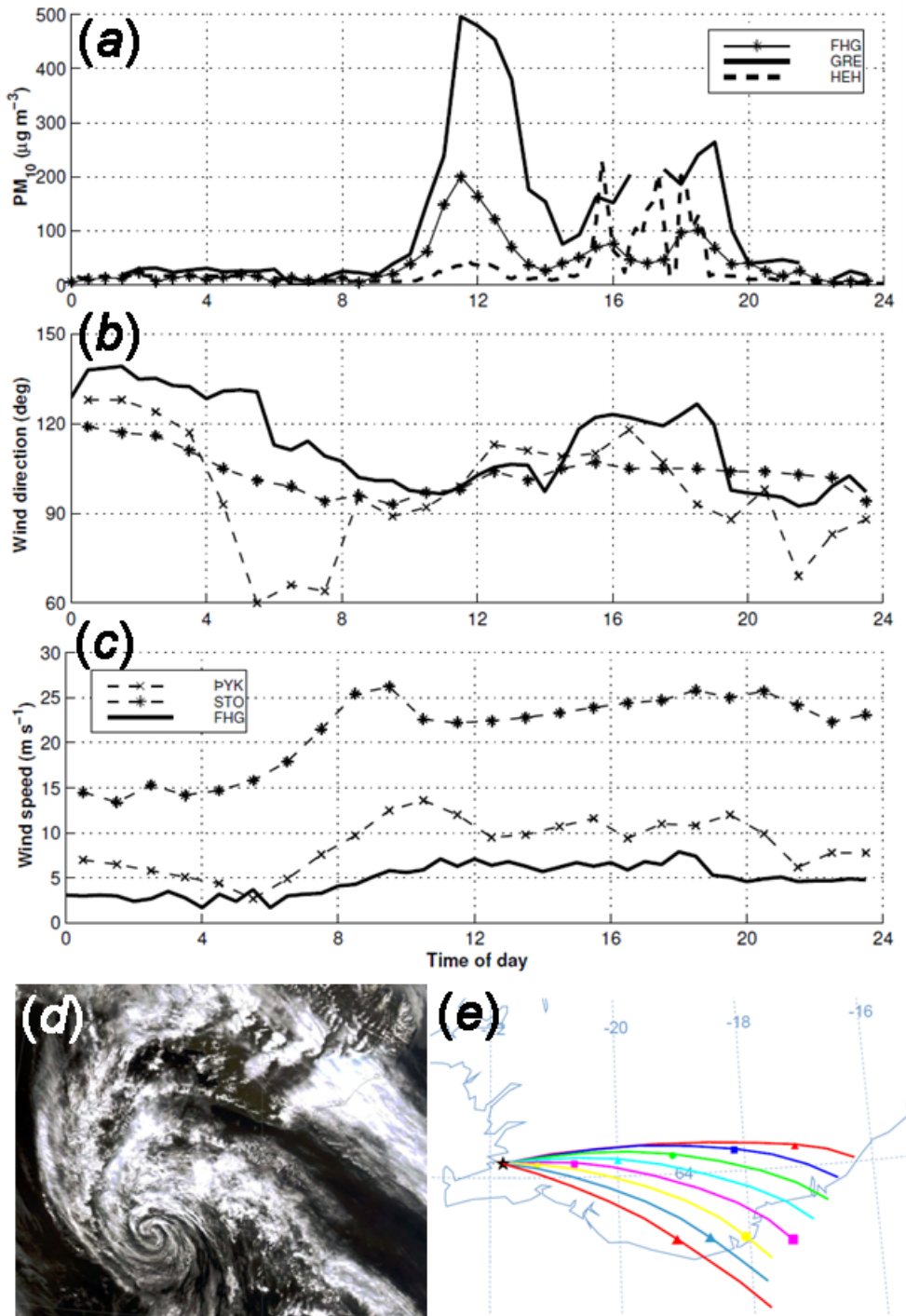


Figure 6. Summary data for dust event on 4 June 2008. (a) PM₁₀ measured at FHG (stars), GRE (solid line), and HEH (dashed line), (b) wind direction and (c) wind speed on June 4, 2008, measured at FHG (solid line), STO (star-dashed line), and PYK (x-dashed line); (d) MODIS image from 14:17 on June 4, 2008, showing the low south of Iceland responsible for the wind that caused the dust storm that day; (e) NOAA HYSPLIT runs (bottom right) for June 4, 2008, showing particle paths for backward trajectories ending in Reykjavík at 12:00 UTC.

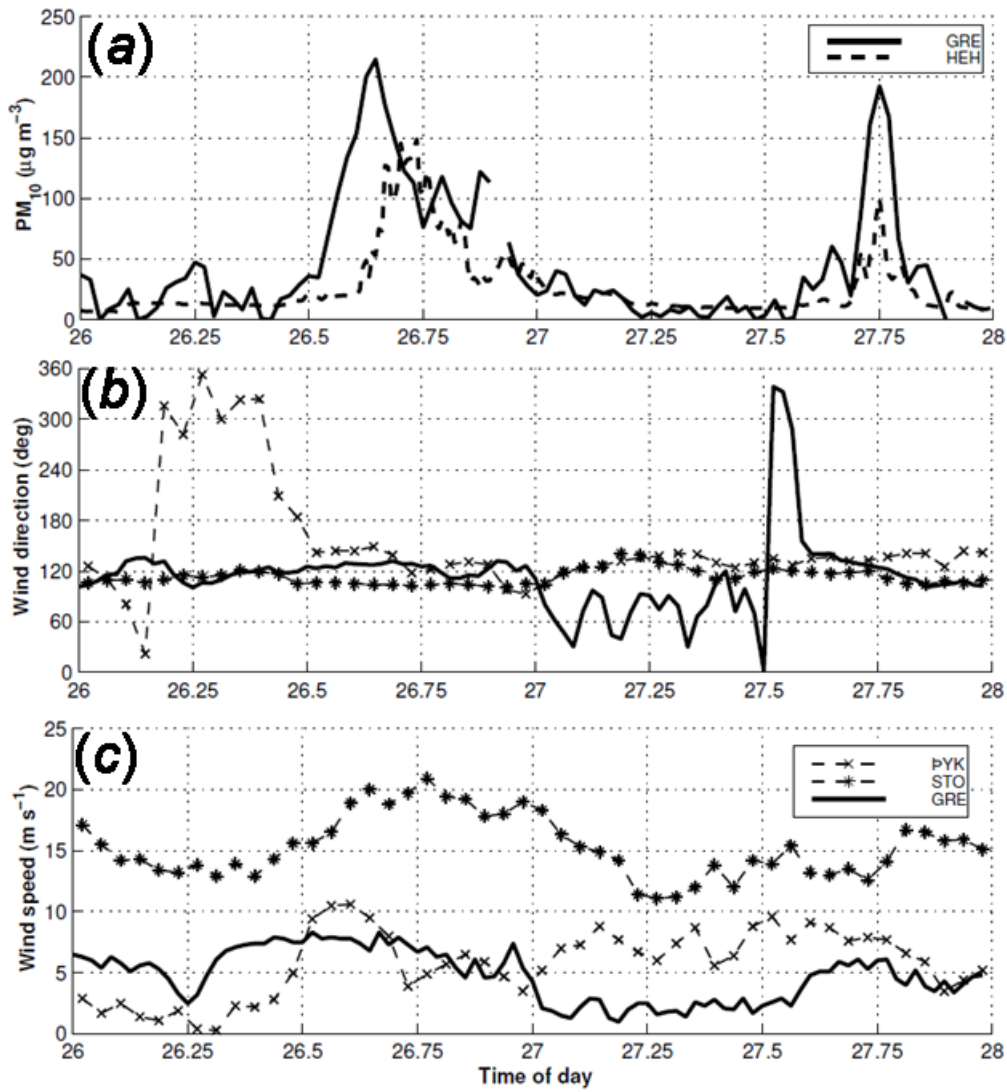


Figure 7. Summary data for dust event on 26-27 July 2008. (a) PM₁₀ measured at GRE (30-min values; solid line) and HEH (10-min values; dashed line), (b) wind direction and (c) wind speed on July 26 and 27, 2008, measured at GRE (solid line), STO (star-dashed line), and PYK (x-dashed line).

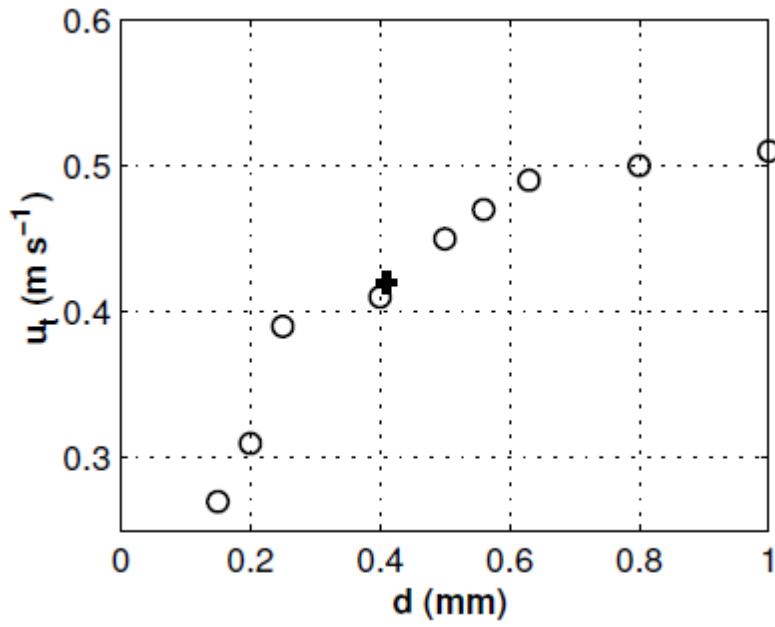


Figure 8. Threshold velocity u_t as a function of grain size d (Liu et al., 2006, Table 2). The value for Landeyjasandur (Arnalds et al., 2001, Table 2) is marked by a '+'.

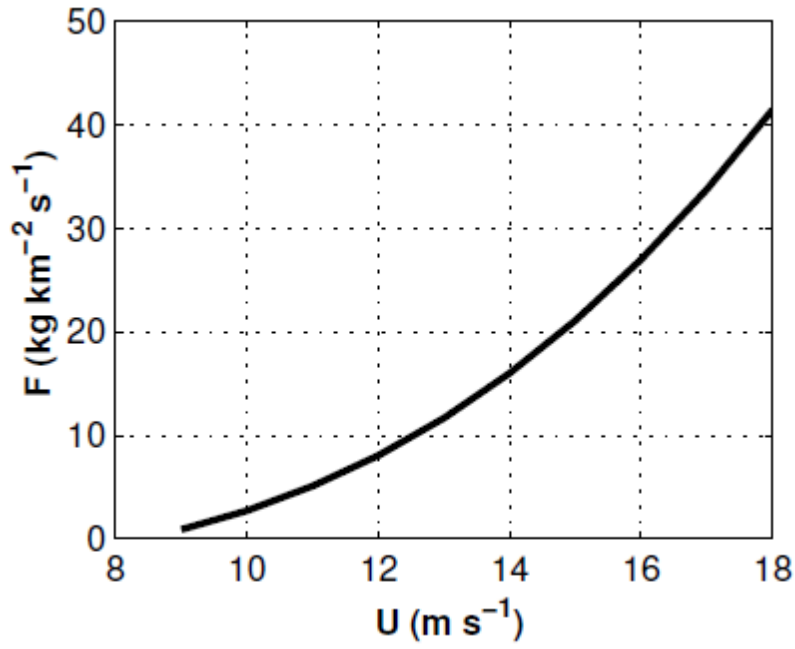


Figure 9. Calculated vertical mass flux of PM₁₀ material, F (kg km⁻² s⁻¹) (Eq. 1), as a function of wind speed at 2 m elevation. Here $\alpha = 0.2 \times 10^{-3} \text{ m}^{-1}$, $z_0 = 0.7 \text{ mm}$, and $u_t = 0.42 \text{ m s}^{-1}$.

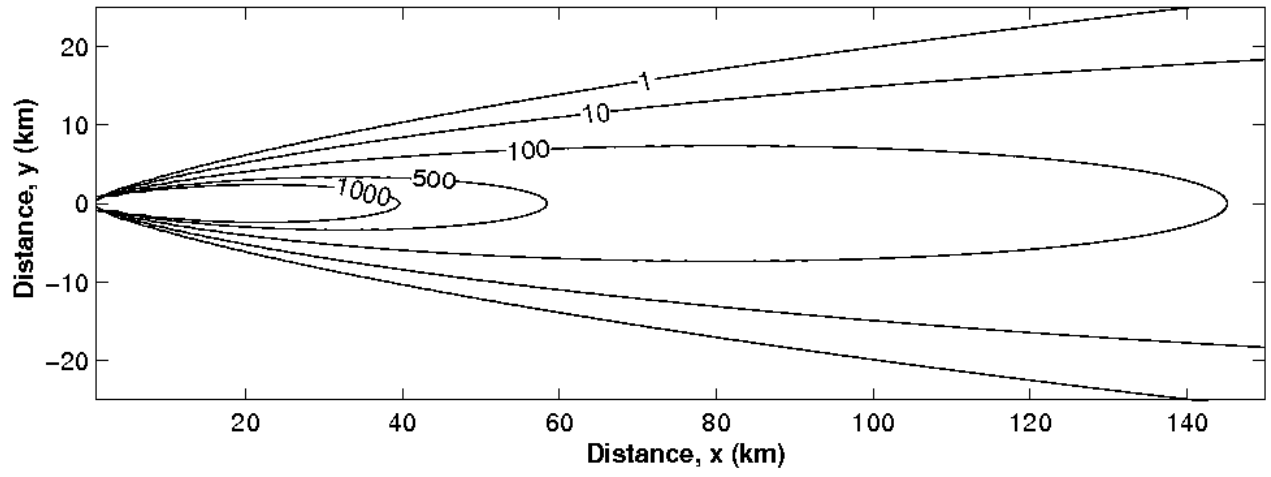


Figure 10. Concentration ($\mu\text{g m}^{-3}$) as a function of distance from a point source, where the wind speed U is 10 m s^{-1} , and the source strength S is 200 kg s^{-1} .