Supporting Information for "Modeling Haboob Dust Storms in Large-Scale Weather and Climate Models"

Florian Pantillon[1], Peter Knippertz[1], John H. Marsham[2], Hans-Jürgen

Panitz[1], and Ingeborg Bischoff-Gauss[3],

Contents of this file

Introduction

The supporting information provides additional figures to complement those in the

paper, in particular for comparison with *Pantillon et al.* [2015].

────────

[1]Institute of Meteorology and Climate

Research, Karlsruhe Institute of Technology,

Karlsruhe, Germany

[2]Water@Leeds, National Centre for

Atmospheric Science, University of Leeds,

Leeds, United Kingdom

[3]Steinbuch Centre for Computing,

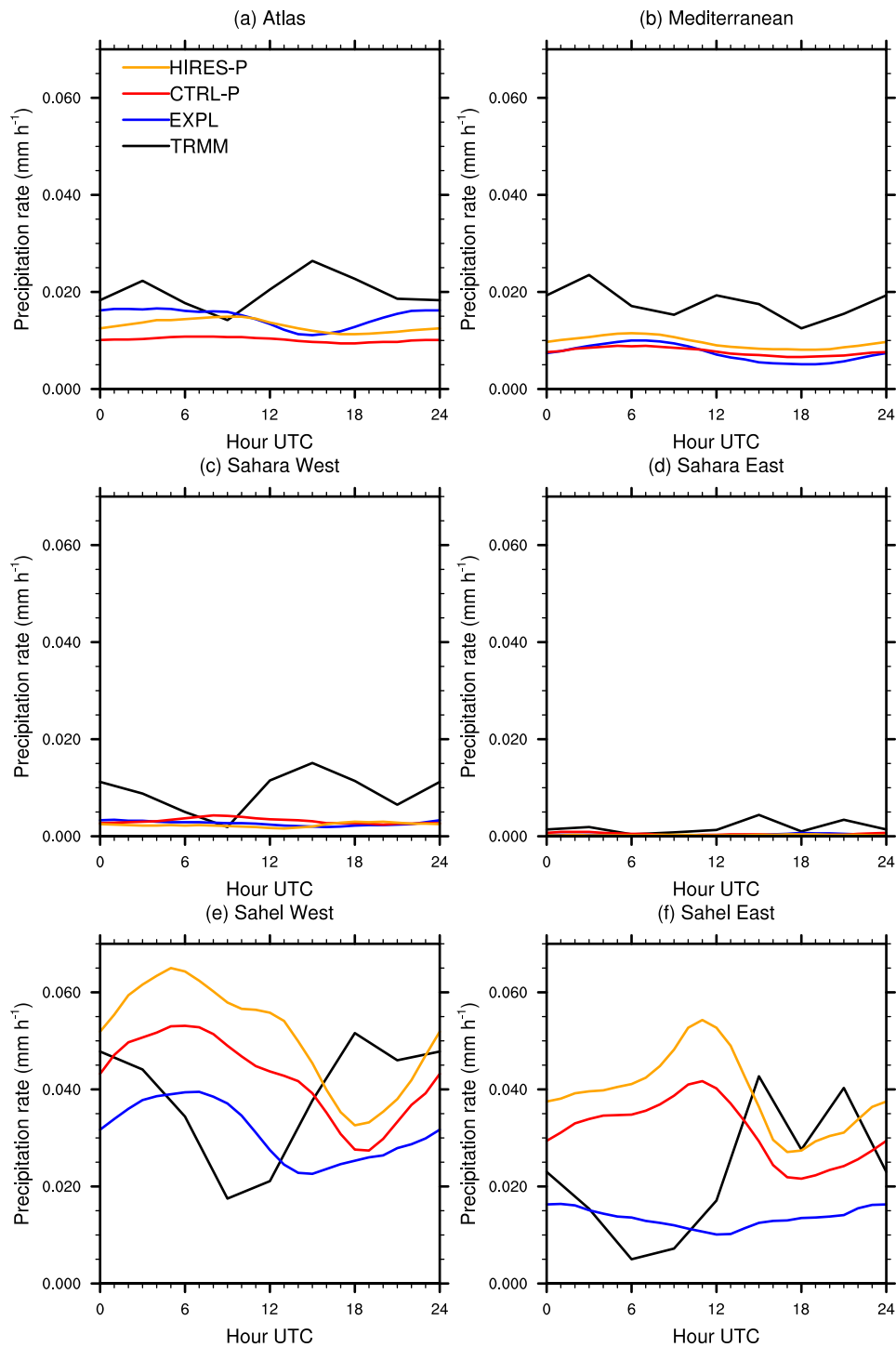Karlsruhe Institute of Technology,

Karlsruhe, Germany

Figure S1. Diurnal cycle in precipitation rate averaged over the year 2006 and over each area marked by a box in Figure 4 in the TRMM-3B42 observation product and in the EXPL, CTRL-P, and HIRES-P model runs (Table 1).
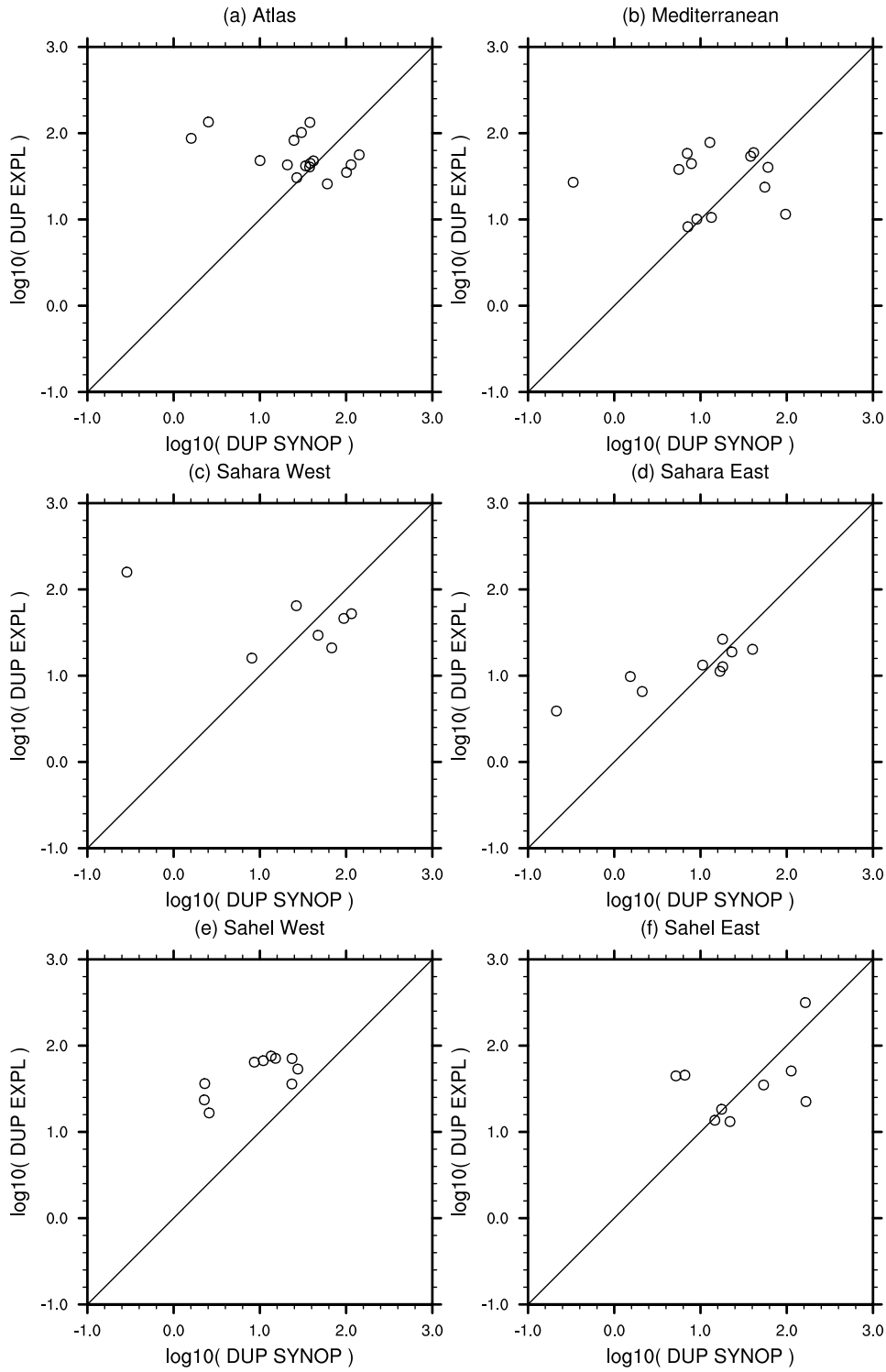
Figure S2. Scatter plot of DUP averaged over the year 2006 from the observed wind at SYNOP stations and from the model wind in the EXPL model run subsampled at the location and time of the observations.
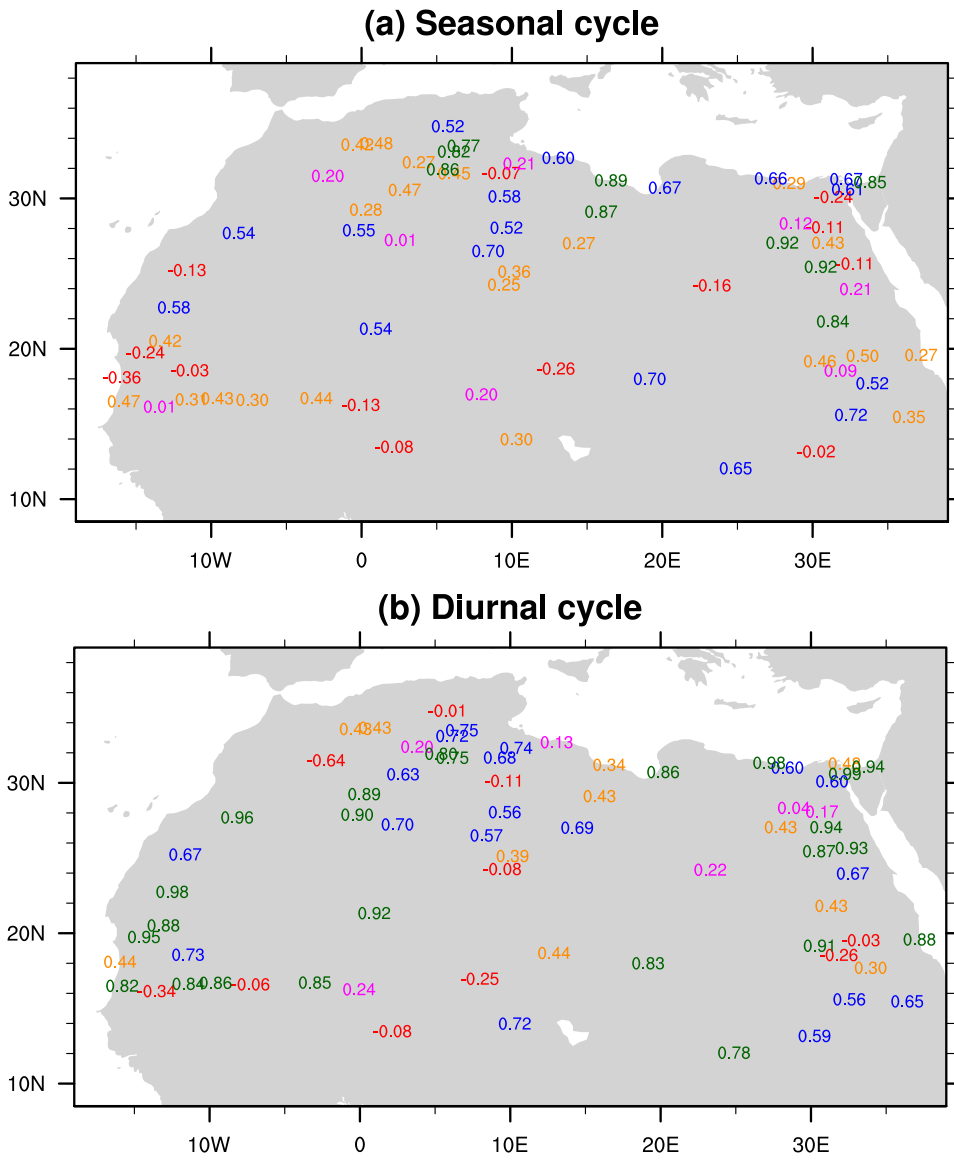
(a) Seasonal cycle

(b) Diurnal cycle

Figure S3. Correlation of the seasonal cycle (a) and diurnal cycle (b) in DUP from the observed wind at SYNOP stations and from the model wind in the EXPL model run subsampled at the location and time of the observations.
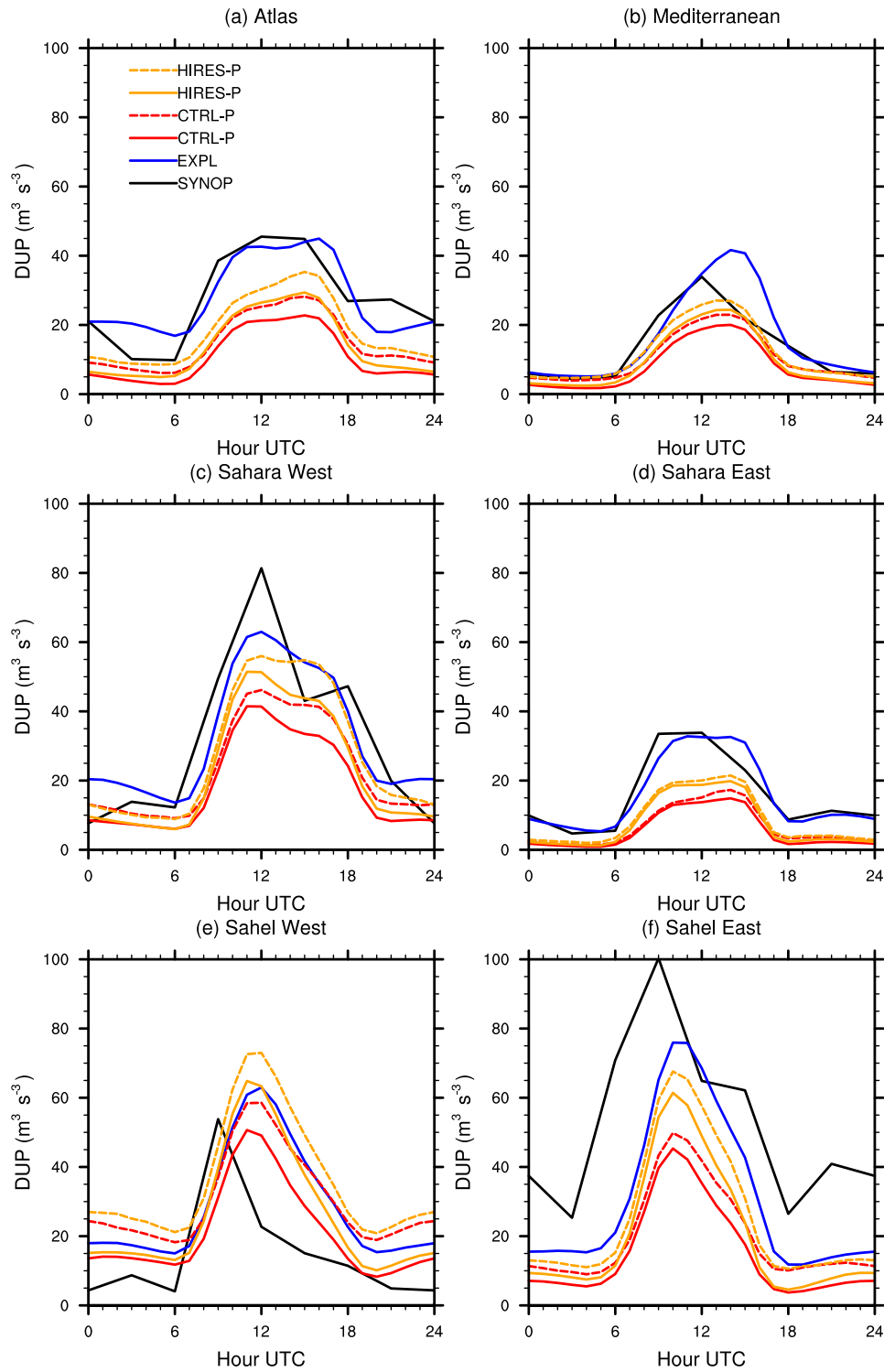
Figure S4. Diurnal cycle in DUP averaged over the year 2006 and over each area marked by a box in Figure 7 from the observed wind at SYNOP stations and from the model wind in the EXPL, CTRL-P, and HIRES-P model runs (Table 1). The dashed curves show the total DUP from the resolved model wind and the haboobs parameterized with the original formulation.
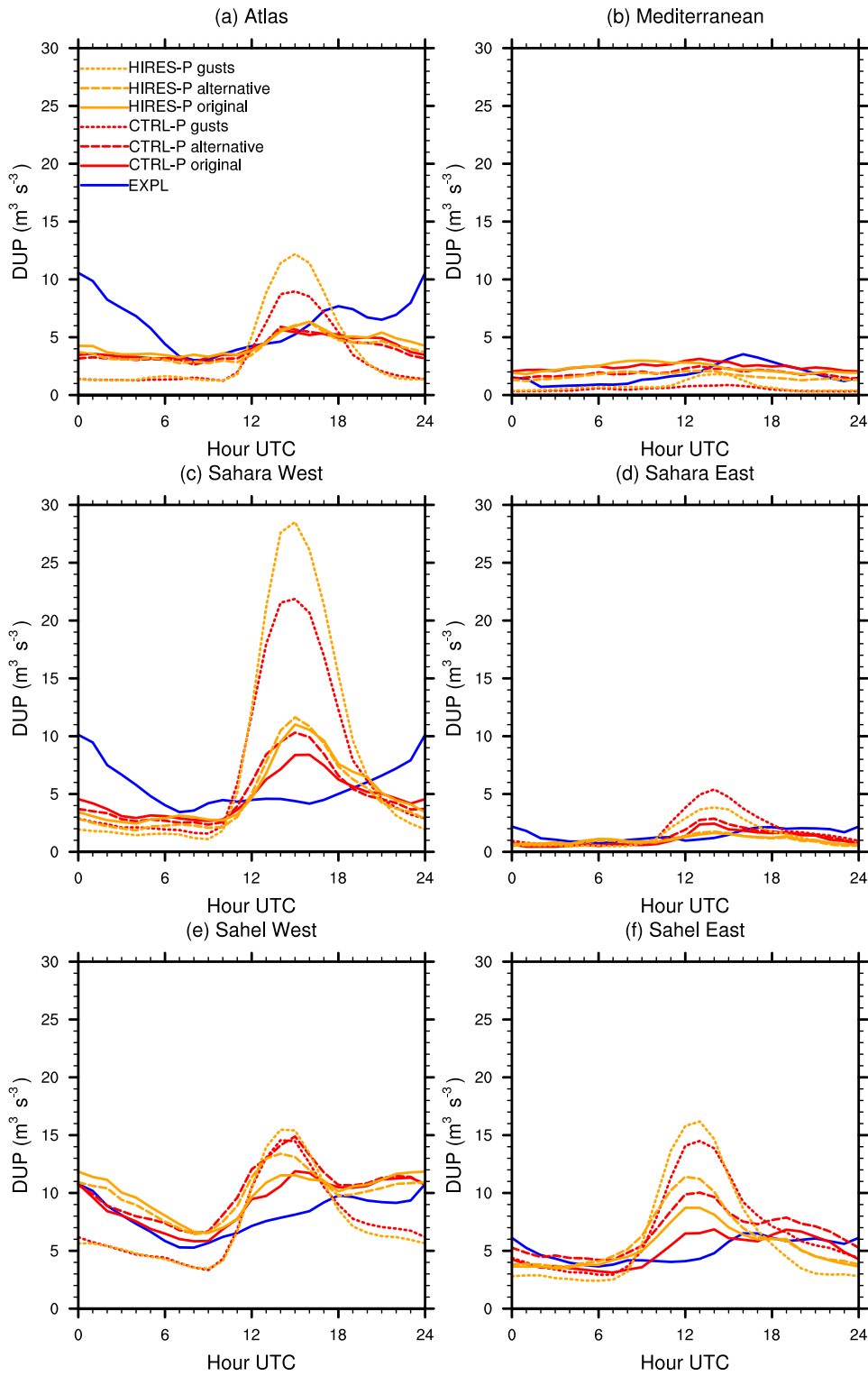
Figure S5. Diurnal cycle in DUP from haboobs averaged over the year 2006 and over each area

marked by a box in Figure 11 from haboobs identified in EXPL and parameterized in CTRL-P

and HIRES-P with the original, the alternative, and the gust formulation (Table 3).
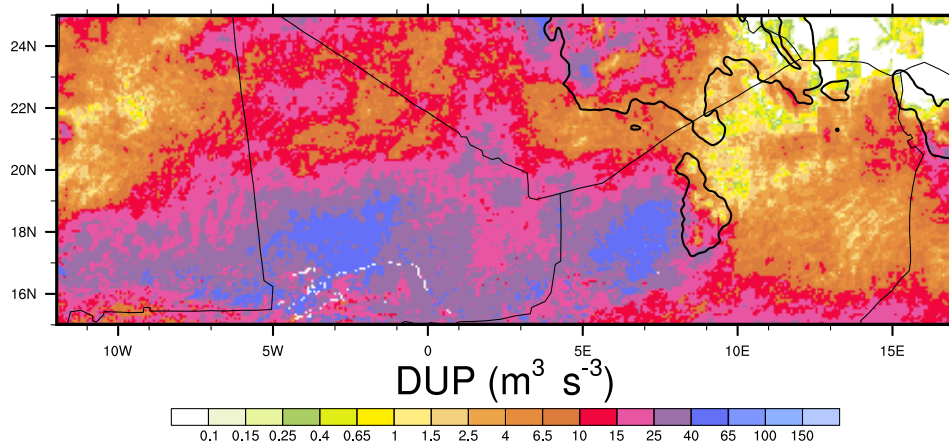
Figure S6. Spatial distribution of DUP from haboobs identified in the EXPL model run, as in Figure 11a but for the June-July period only and over the area used for calibration by *Pantillon et al.* [2015]. The contours show the 800-m elevation in the model.
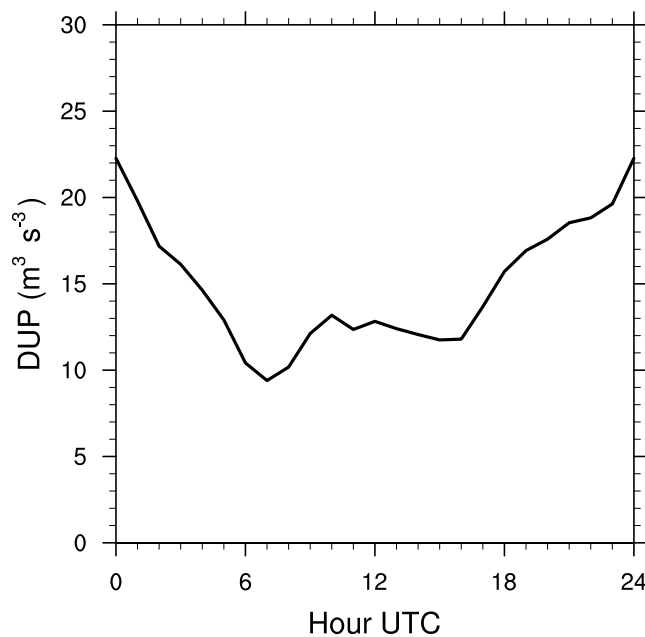

Figure S7. Diurnal cycle in DUP from haboobs identified in the EXPL model run, as in Figure 13 but for the June-July period only and over the area used for calibration by *Pantillon et al.* [2015].