Corrigendum

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We regret to acknowledge that in our original article (Liu et al. 2013), incorrect results on the Eta and the Pleim–Xiu land surface model (PX scheme) were used in Figs. 11, 12, and 15, which also result in some incorrect subsequent discussions in sections 4 and 6. This corrigendum serves to correct these errors in the order of their occurrence in the original paper.

With Fig. 11 corrected, the corresponding discussion on p. 787 in section 4b(5) is accordingly modified as follows:

Figure 11 further compares the diurnal variations of the momentum (Fig. 11a), sensible heat flux (Fig. 11c), and latent heat flux (Fig. 11e), respectively, in order to examine the temporal dependence of the parameterizations’ performance. Also shown in Figs. 11b, 11d, and 11f are the diurnal variations of the corresponding standard deviations, respectively. Figure 11a shows that in correspondence with the excellent statistical agreement between the parameterized and EC momentum fluxes (Fig. 2), all the parameterizations capture the diurnal variations to different degrees. All the schemes overestimate the EC-observed momentum flux during the late morning and afternoon, while the GISS and GFDL schemes produce the relatively largest standard deviations, as shown in Fig. 11b.

Figure 11c shows that all the parameterizations qualitatively capture, but quantitatively magnify, the diurnal cycle of the energy balance Bowen ratio (EBBR) and eddy correlation (EC)-observed sensible heat fluxes. The magnification of the diurnal cycle differs among the parameterizations. Similar patterns of behavior hold for the diurnal variation of the corresponding standard deviations. Figure 11e indicates that all the schemes are able to qualitatively capture the observed diurnal variation of the latent heat flux. It is noteworthy that the interscheme differences are somewhat larger than the two observational sets, suggesting that either EBBR or EC observations can be used to assess parameterized diurnal cycles of sensible and latent heat fluxes.

With Fig. 12 corrected, accordingly, the paragraph on p. 788 in section 4b(6) is changed as follows:

Figure 12 compares the seasonal variations of the momentum (Fig. 12a), sensible heat flux (Fig. 12c), and latent heat flux (Fig. 12e), as well as the seasonal variations of the corresponding standard deviations (Figs. 12b, 12d, and 12f), respectively. Figures 12a and 12b show that the seasonal variations of the parameterized and observed momentum fluxes are not that evident. For the sensible heat flux, Figs. 12c and 12d indicate that all the schemes capture the seasonal variations of the EC and EBBR observations well in terms of both
monthly mean and standard deviation, but the schemes significantly overestimate the EC and EBBR observations in the monthly mean. In Figs. 12e and 12f, the schemes also capture the seasonal variations of the EC- and EBBR-observed latent heat fluxes well. It is noteworthy that the EC and EBBR observations reach their maxima around June and July whereas the parameterized fluxes peak in August. The lag of the parameterized latent heat fluxes is probably due to the fact that the saturation surface specific humidity at the surface...
skin temperature, not the actual surface specific humidity, is used in the parameterizations. More study is needed to improve the latent heat flux parameterization.

Figures 15b and 15c are corrected, too.

All the corrections also result in some changes on p. 794 in section 6 (the conclusions). The correct description should be as follows:

**Fig. 12.** Comparison of seasonal variation of the surface turbulent fluxes between the parameterizations and EC observations: (a) monthly mean of the momentum flux (friction velocity), (b) standard deviation of the monthly mean of the momentum flux (friction velocity), (c) monthly mean of the sensible heat flux, (d) standard deviation of the monthly mean of the sensible heat flux, (e) monthly mean of the latent heat flux, and (f) standard deviation of the monthly mean of the latent heat flux. The EBBR observation is treated as a parameterization here.
Statistical analysis shows that among the quantities examined (momentum flux, sensible heat flux, latent heat flux, Bowen ratio, and evaporation fraction), the best parameterized is the momentum flux. All six surface flux parameterization (SFP) schemes perform well with parameterized momentum fluxes with only a small discrepancy between the different

Fig. 15. Semihourly mean of the temperature and flux differences varying with the surface net radiation. (a) The temperature difference is the surface radiative temperature minus the air temperature, and (b), (c) the flux difference is the parameterized surface flux minus the EC-observed surface flux. The EBBR observation is treated as a parameterization here.
schemes. Nevertheless, there are still differences in the functional dependence on stability, suggesting the need for further improvement.

The sensible and latent heat fluxes observed by the EBBR and EC systems are in reasonably good agreement with each other, although the discrepancy is still noteworthy. The parameterized sensible heat and latent heat fluxes compare poorly with the corresponding EC observations and all six of the SFP schemes underestimate the sensible heat flux when the observed fluxes are positive. Relatively, the three schemes used in the GCMs produce better estimates for the latent heat flux than do those used in the WRF Model. Furthermore, all the parameterization schemes tend to exaggerate the magnitude of the diurnal variation of the sensible heat flux, although they qualitatively capture the diurnal cycle. All the schemes also qualitatively reproduce the diurnal cycle of the latent heat flux.

All of the parameterization schemes capture the seasonal variations of the sensible and latent heat fluxes, but they significantly overestimate the sensible heat flux in all months. Moreover, the seasonal maximum of the parameterized latent heat fluxes is lagged for about 1 month compared to the EC and EBBR observations. The errors in the parameterized sensible and latent heat fluxes are further magnified when they are converted into their respective Bowen ratio or evaporative fraction, presenting higher accuracy requirements for the SFP schemes.

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REFERENCE