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Supplement of

Optimization of weather forecasting for cloud cover over the European domain using the meteorological component of the Ensemble for Stochastic Integration of Atmospheric Simulations version 1.0

Yen-Sen Lu et al.

Correspondence to: Yen-Sen Lu (ye.lu@fz-juelich.de)

Supplement Figures

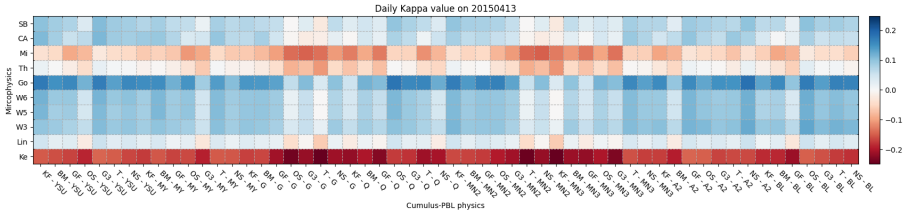

Figure S1. The heat map of average kappa for every configuration for the clusters of microphysics (Y axis) with the cluster of cumulus parameterization and PBL (x-axis) on the simulation case 2015-04-13. The data is only use the last 36 hours of simulations for calculating the kappa.

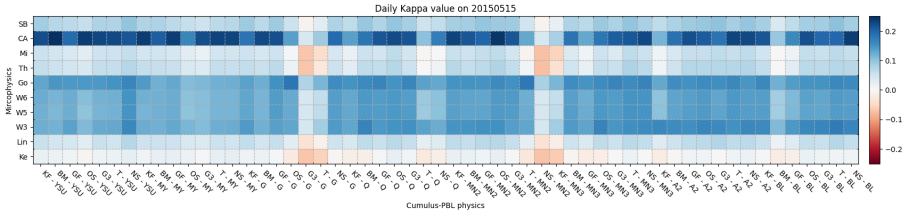

Figure S2. The heat map of average kappa for every configuration for the clusters of microphysics (Y axis) with the cluster of cumulus parameterization and PBL (x-axis) on the simulation case 2015-05-15. The data is only use the last 36 hours of simulations for calculating the kappa.

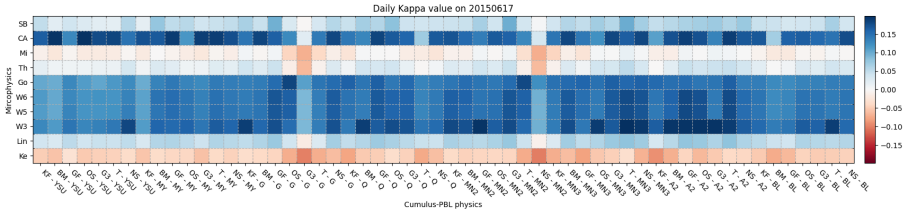

Figure S3. The heat map of average kappa for every configuration for the clusters of microphysics (Y axis) with the cluster of cumulus parameterization and PBL (x-axis) on the simulation case 2015-06-17. The data is only use the last 36 hours of simulations for calculating the kappa.

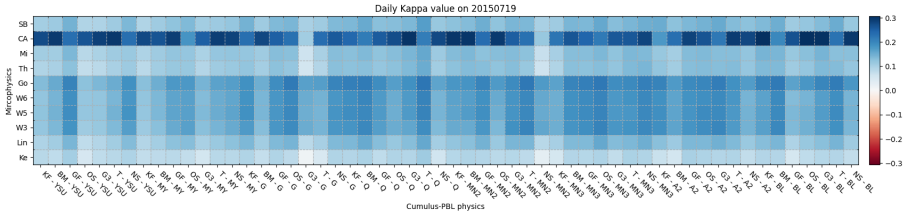

Figure S4. The heat map of average kappa for every configuration for the clusters of microphysics (Y axis) with the cluster of cumulus parameterization and PBL (x-axis) on the simulation case 2015-07-19. The data is only use the last 36 hours of simulations for calculating the kappa.

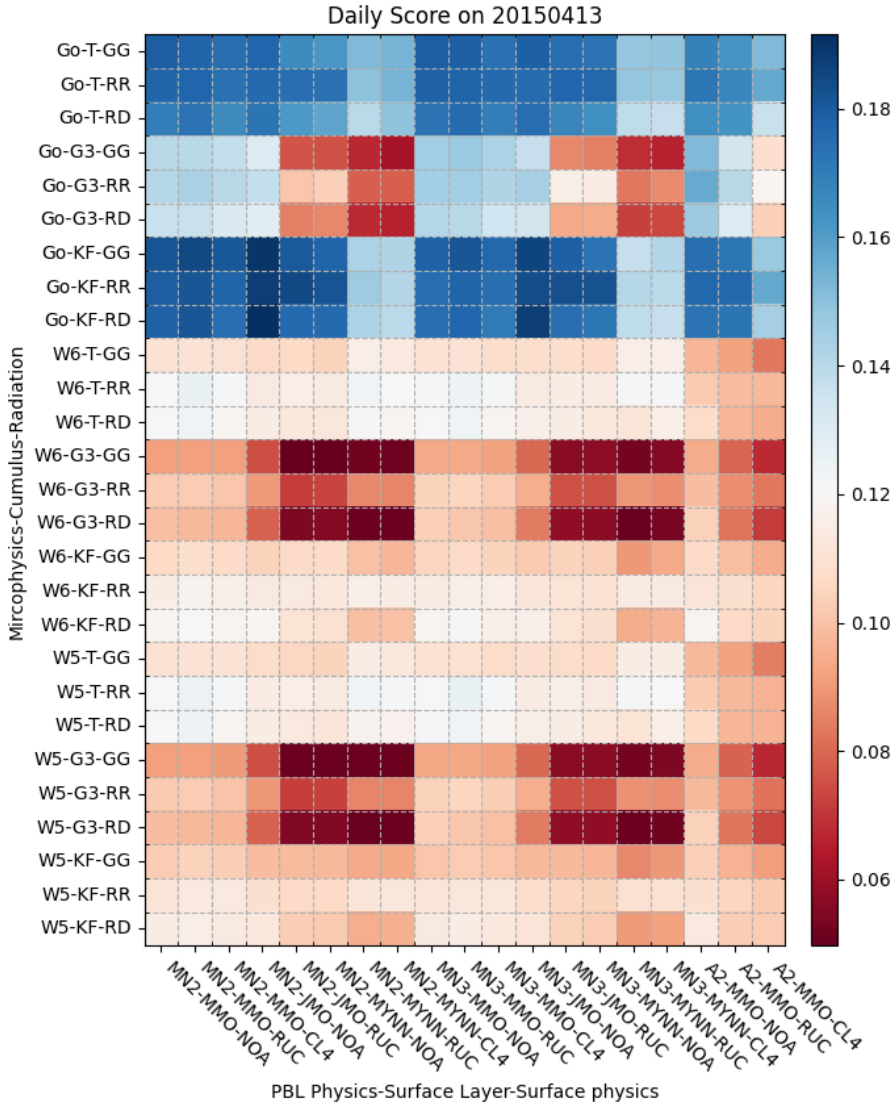

Figure S5. The heat map of the average kappa for the configuration for the clusters of microphysics, cumulus parameterization, and the radiation physics (Y axis) with the cluster of PBL-physics, surface physics, and the land surface model (x-axis) on the simulation case 2015-04-13. The data is only use the last 36 hours of simulations for calculating the kappa.

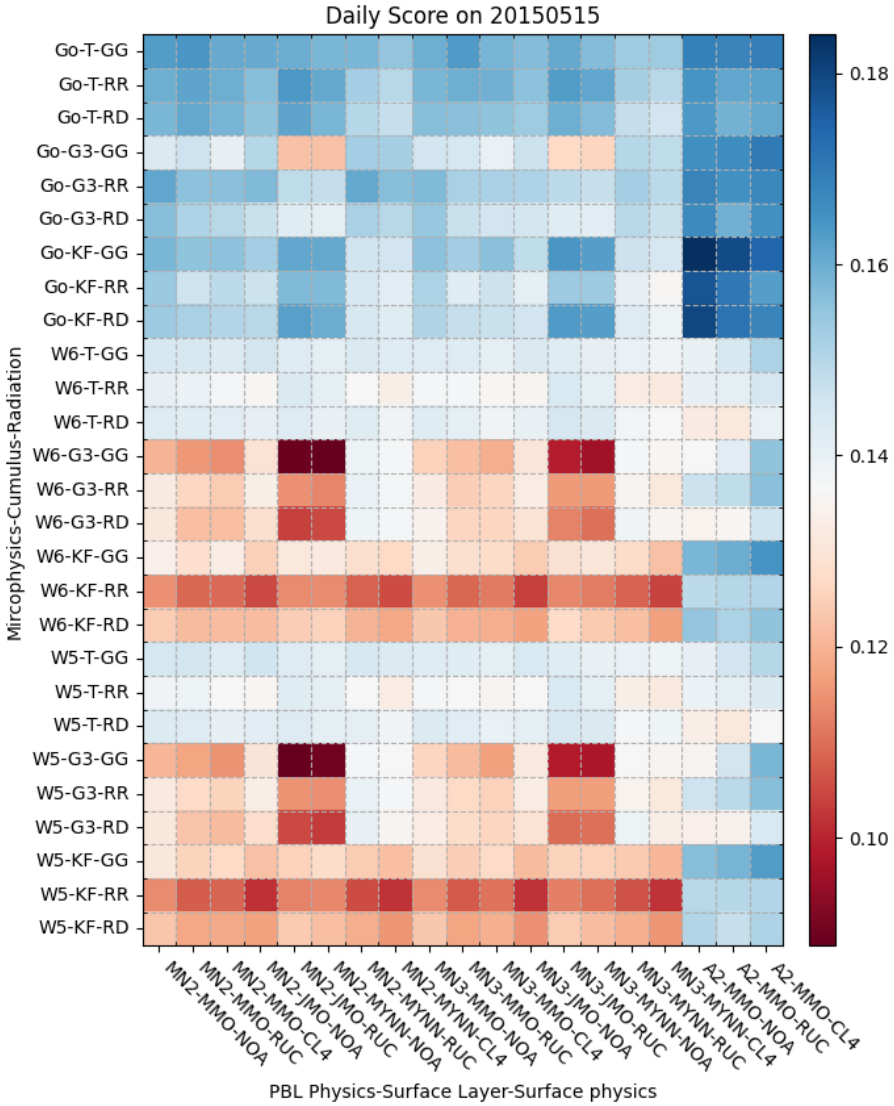

Figure S6. The heat map of the average kappa for the configuration for the clusters of microphysics, cumulus parameterization, and the radiation physics (Y axis) with the cluster of PBL-physics, surface physics, and the land surface model (x-axis) on the simulation case 2015-05-15. The data is only use the last 36 hours of simulations for calculating the kappa.

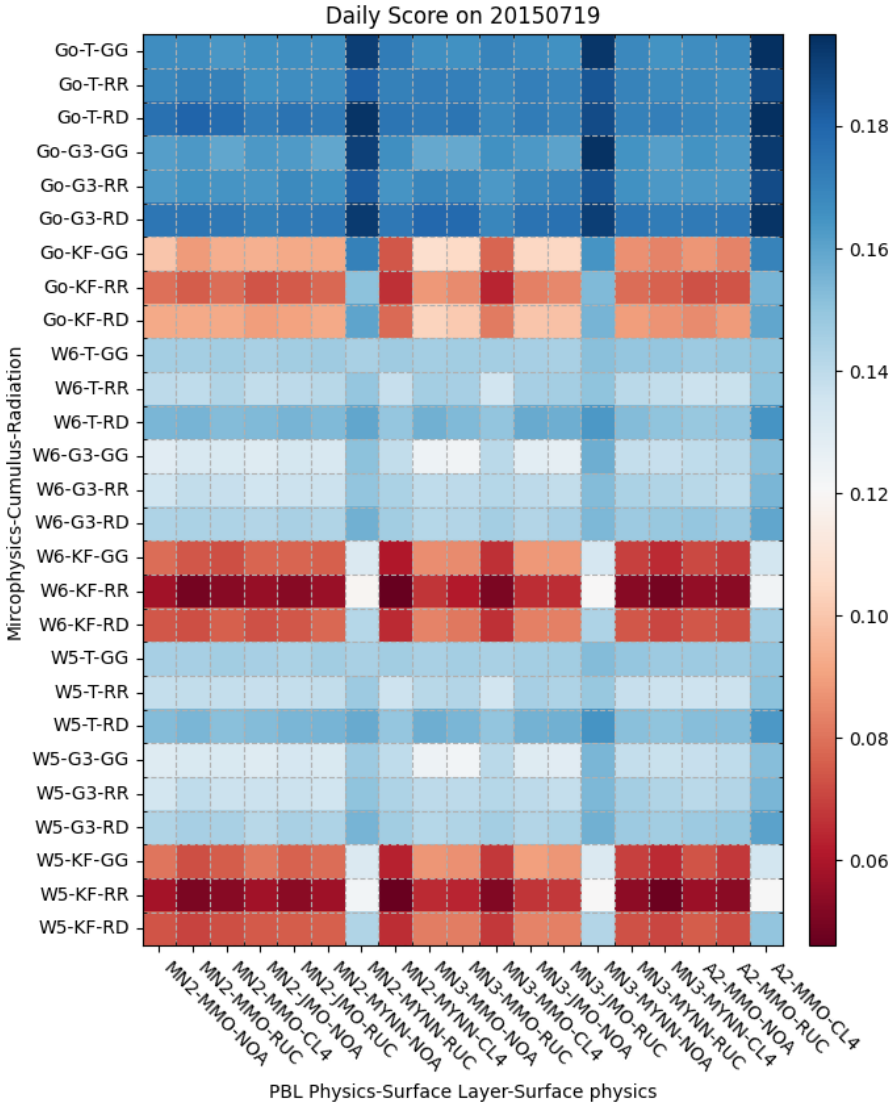

Figure S7. The heat map of the average kappa for the configuration for the clusters of microphysics, cumulus parameterization, and the radiation physics (Y axis) with the cluster of PBL-physics, surface physics, and the land surface model (x-axis) on the simulation case 2015-07-19. The data is only use the last 36 hours of simulations for calculating the kappa.

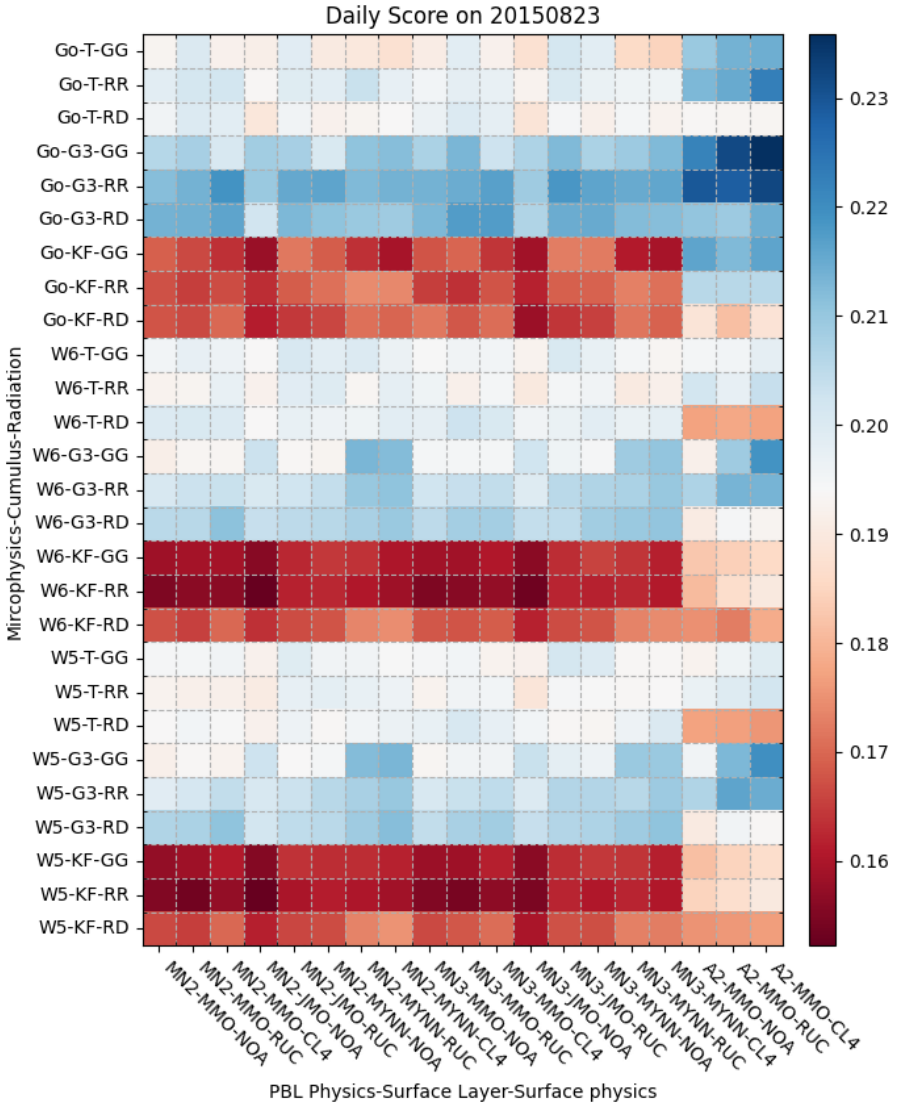

Figure S8. The heat map of the average kappa for the configuration for the clusters of microphysics, cumulus parameterization, and the radiation physics (Y axis) with the cluster of PBL-physics, surface physics, and the land surface model (x-axis) on the simulation case 2015-08-23. The data is only use the last 36 hours of simulations for calculating the kappa.

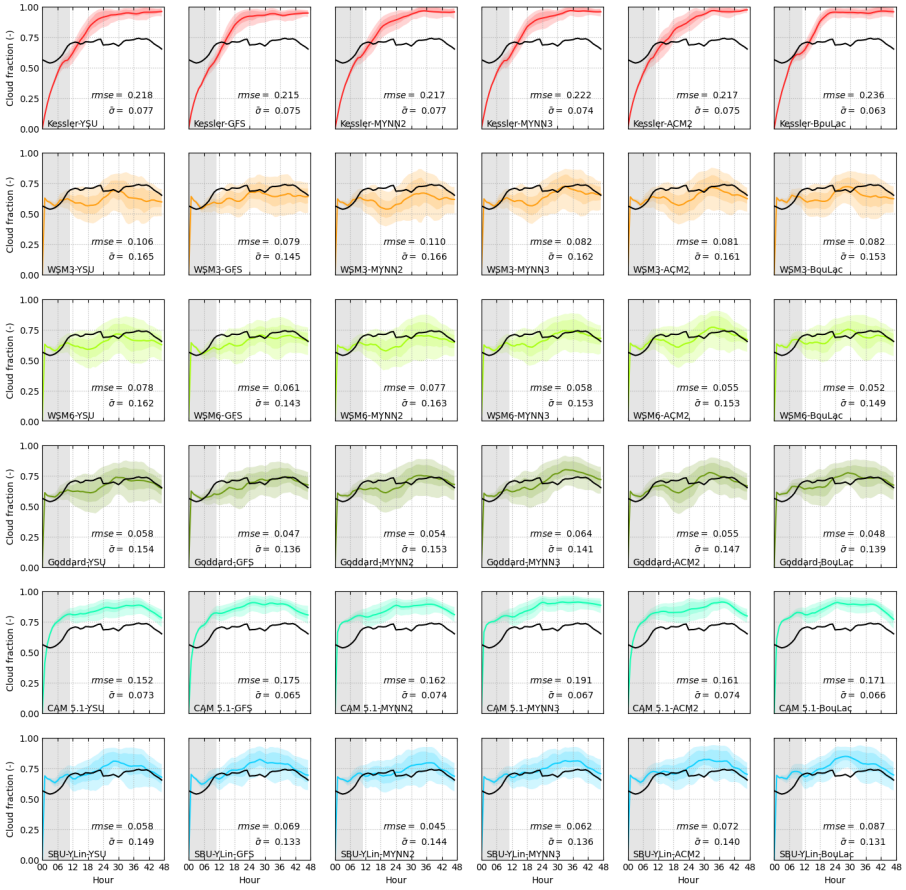

Figure S9. The mean cloud cover fraction (-) the observation from the satellite (black line) and by simulation (color line) from the combination of microphysics (by different color) and PBL physics (in different row) in case 2015-04-13. The color block represents the range of percentiles, the darker block is limited between 25% and 75%, and the lighter block is limited between 5% and 95%. The grey block indicates the spin-up time for ESIAS-met, which is not included in the root mean square error *rmse*, standard deviation ($\bar{\sigma}$), and the mean simulated cloud cover fraction ($\bar{x}$).

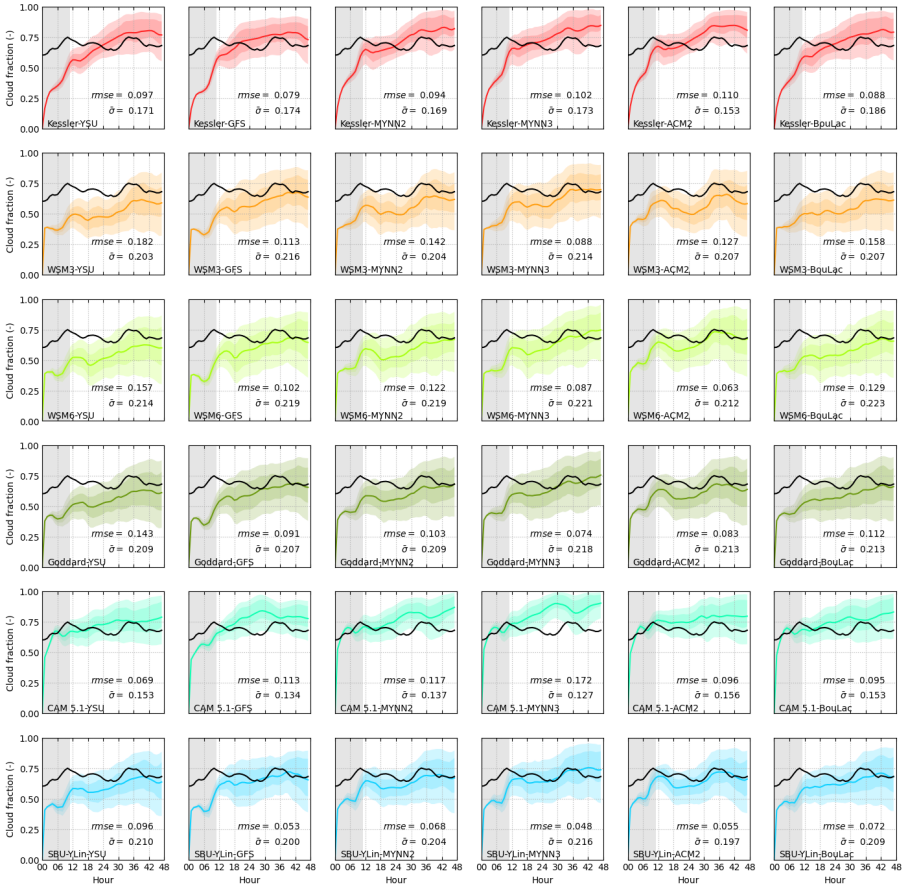

Figure S10. The mean cloud cover fraction (-) the observation from the satellite (black line) and by simulation (color line) from the combination of microphysics (by different color) and PBL physics (in different row) in case 2015-05-15. The color block represents the range of percentiles, the darker block is limited between 25% and 75%, and the lighter block is limited between 5% and 95%. The grey block indicates the spin-up time for ESIAS-met, which is not included in the root mean square error *rmse*, standard deviation ($\bar{\sigma}$), and the mean simulated cloud cover fraction ($\bar{x}$).

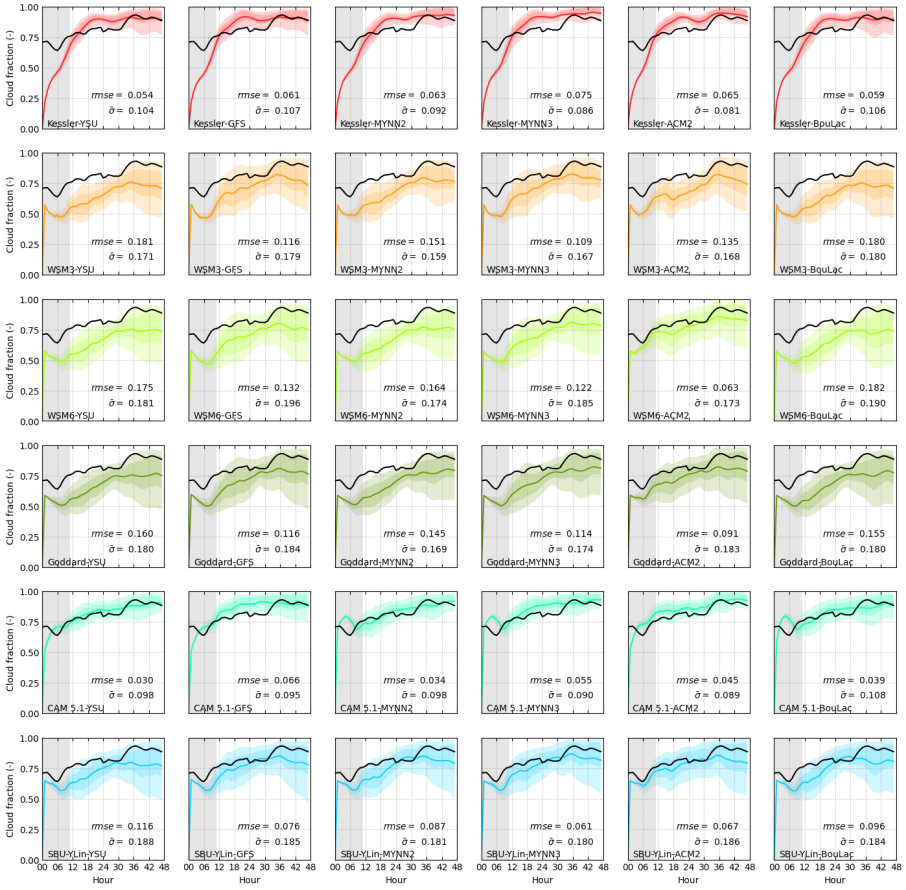

Figure S11. The mean cloud cover fraction (-) the observation from the satellite (black line) and by simulation (color line) from the combination of microphysics (by different color) and PBL physics (in different row) in case 2015-06-17. The color block represents the range of percentiles, the darker block is limited between 25% and 75%, and the lighter block is limited between 5% and 95%. The grey block indicates the spin-up time for ESIAS-met, which is not included in the root mean square error *rmse*, standard deviation ($\bar{\sigma}$), and the mean simulated cloud cover fraction ($\bar{x}$).

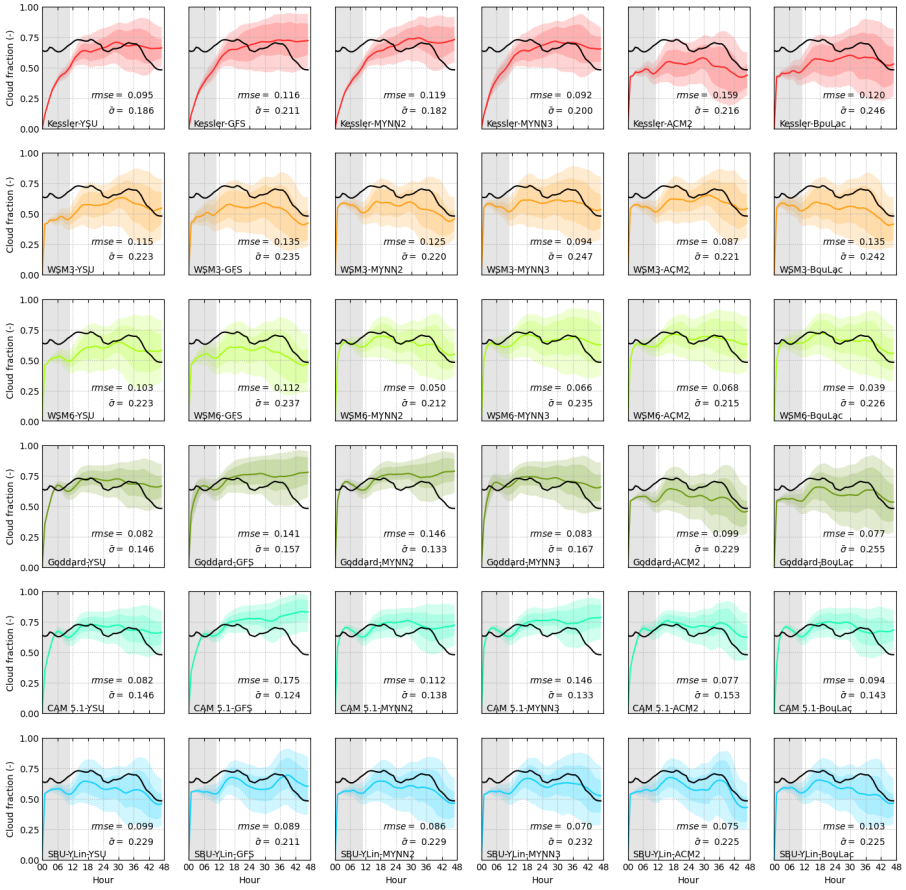

Figure S12. The mean cloud cover fraction (-) the observation from the satellite (black line) and by simulation (color line) from the combination of microphysics (by different color) and PBL physics (in different row) in case 2015-07-19. The color block represents the range of percentiles, the darker block is limited between 25% and 75%, and the lighter block is limited between 5% and 95%. The grey block indicates the spin-up time for ESIAS-met, which is not included in the root mean square error *rmse*, standard deviation ($\bar{\sigma}$), and the mean simulated cloud cover fraction ($\bar{x}$).

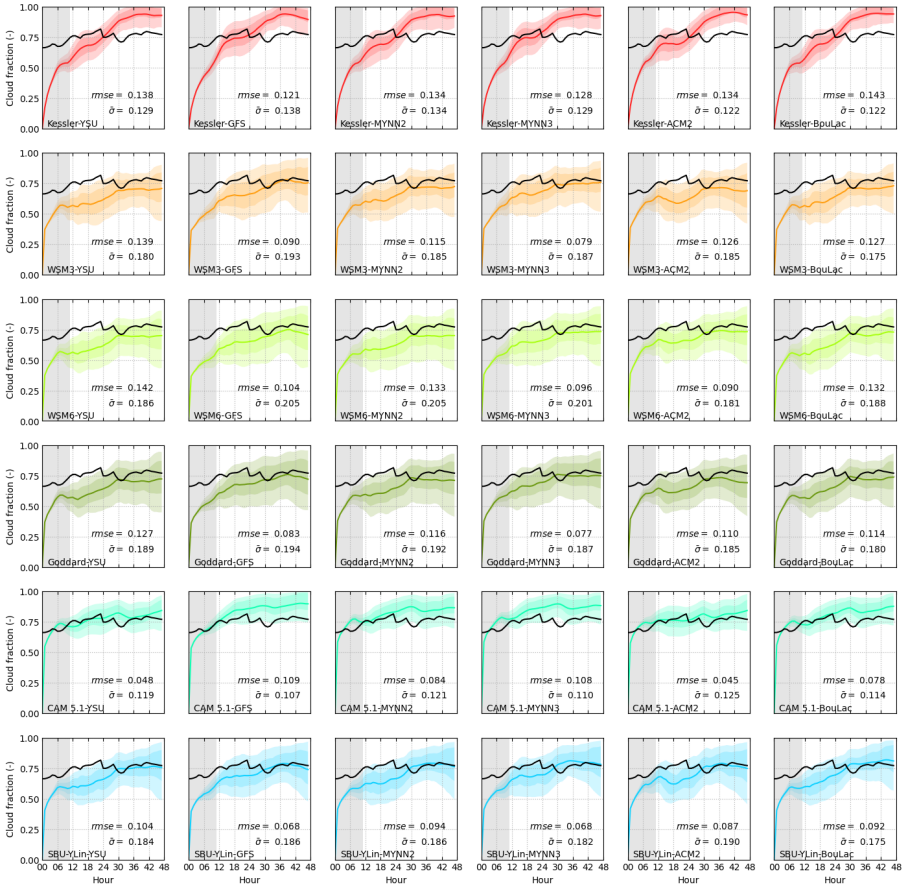

Figure S13. The mean cloud cover fraction (-) the observation from the satellite (black line) and by simulation (color line) from the combination of microphysics (by different color) and PBL physics (in different row) in case 2015-09-21. The color block represents the range of percentiles, the darker block is limited between 25% and 75%, and the lighter block is limited between 5% and 95%. The grey block indicates the spin-up time for ESIAS-met, which is not included in the root mean square error *rmse*, standard deviation ($\bar{\sigma}$), and the mean simulated cloud cover fraction ($\bar{x}$).