Atmospheric Chemistry and Physics Discussions

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Comment on acp-2022-49

Anonymous Referee #1

Referee comment on "Convective updrafts near sea-breeze fronts" by Shizuo Fu et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-49-RC1, 2022

The manuscript examines the updraught strengths along and ahead the sea breeze front in an idealised LES setup with varying surfcae sensible heat flux over land and demonstrates why the updraughts are of dimilar strength but wider along the sea breeze front. It is a compnion paper of anotehr paper by Fu et al.

While the manuscript is well written and concise, the Figures are of good quality and it is reasonably convincing, it is still somewhat thing concerning parameter sampling and given that there is already a companion paper.
I found the discussion of older literature relatively thin, you can find more on it e.g. in Bechtold et al 1991, where also the effect on the background wind is discussed. In your results you simply dropped all discussion and experimentation on background wind and Coriolus scaling and I would ask at least for additional experimentation with varying background winds.
Also I found the discussion of boundary-layer rolls/streaks streaks l165-169 very thin, there is more literature on it including e.g on inflection point instability etc. So these streaks or rolls depend on the surface fluxes over sea (set to zero in your experiment) , more complicated in a moist problem, and the wind shear and will necessarily effect the updraughts. So you might also expand a bit more on this, possibly experimentally