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Review of the paper entitled
Surface deposition of marine fog and its treatment in WRF model

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by Peter Allan Taylor et al.

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This paper addresses the difficult topic to investigate the effect of turbulent transfer of fog droplets to the surface. Current NWP models do not take into account this process leading to an overestimation of fog liquid water content near the ground. This model bias is well known but has not been studied in detail with a scientific approach like in this article. This work studied the fog deposition through the Monin-Obukhov framework and a roughness length for liquid water. To my knowledge, this is the first time that this kind of approach is used to parametrized fog deposition. The proposed parameterization is tested in 1D and 3D WRF simulations, illustrating the impact of fog deposition on vertical profiles of liquid water content. This work is innovative and very interesting.

However, I think that some shortcomings should be addressed before the manuscript would be acceptable for publication. Therefore, I can not recommend publication of this paper without major revisions. I recommend that the paper be accepted conditionally with modifications detailed below.

1. **effect of fog deposition on fog life cycle** :
   This article focusses only on vertical profiles of liquid water content (eg fig 1, 2, 4). In my opinion, this approach is necessary but is too restrictive. The impact of fog deposition on fog life cycle and on fog properties should also be studied in detail.
   -What is the impact of deposition on LWP? And consequently what is the impact on radiative processes?
   -What is the impact of deposition on fog life cycle? At which stage (formation, mature, dissipation) is the fog most sensitive to deposition? A time series comparing the amount of water collected at ground by droplet settling and/or by deposition would be helpful to better understand the influence of both processes.
   -What is the influence of wind on fog deposition? The geostrophic wind used in this study is relatively strong, about 20 m/s.
   Please elaborate.

2. **effect of fog deposition on fog spatial extension** :
   In 3D simulations (section 4), I would have liked to see horizontal extension of fog with and without deposition on surface. Does the deposition have an influence on the horizontal extension of fog? on advective processes? What is the impact of deposition on horizontal heterogeneities of the fog layer? Please elaborate.

3. **visibility considerations** :
   In my opinion, the section 8 "Visibility considerations" is out of the goal of this article and does not improve the scientific merit of this article. Numerous visibility parameterizations have been done (eg Kunkel, Gultepe) showing a big dispersion of results. I agree that the visibility parameterizations are very sensitive to the liquid

water content, but it is a well-known results and your study does not have added values in this domain. I would have preferred a discussion on the effect of deposition on fog properties (see previous remarks) and/or a discussion section illustrating the perspective of your work.

4. **notations** :
   -section numbering : 4 model studies (l227) and 4 Operational NWP models (l312)
   -numerous notations for liquid water content : Q_c (eg l61) , W (eg l178) , LWC (eg l192) , q_c (eg l332)
   -reference to Zhang's work : Boundary-Layer Meteorol (2014) 151:293315 and http://cerea.enpc.fr/fich/these_zhang.pdf