Chipade et al. developed a theoretical algorithm for lidar ratio estimation for covering all types of aerosol models and analyzed the effect of relative humidity (RH) on lidar ratio. This is a good work and recommended to be published in AMT after concerning some weaknesses.

Major comments:

1. I think the lidar ratio for polluted and continental and polluted maritime aerosols shown in Figure 5 is declined rather than increased. Could you please explain it in more detail? (L313-315)

2. I'm confused about why the lidar ratios of aerosols indicate the opposite trends when RH is lower or larger than 80% if the water soluble particles dominate aerosols in both RH ranges. More specifically, why does the lidar ratio of water soluble particles increase after the RH reaches 80%? (L315-322)

3. Please cite the reference when trying to use some results from other studies to explain the phenomenon. For instance, L349-351.

Language suggestion:

1) There should be a comma before 'respectively', please change it throughout the whole paper;
2) Line 309/313/341: 'figure' should be 'Figure'.