Revision of response to anonymous referee 2

We have made some minor changes on two of the responses. The changes are given below.

Specific comments

1. The paper discusses the results in terms of their implications for the marine cloud brightening geo-engineering scheme. The results from this study are most certainly relevant but there are some key differences. The plume from a ship stack is highly buoyant and so will reach the cloud even if the boundary layer is stably stratified. The surface generation of sea-salt aerosol will lead to a plume which is if anything slightly negatively buoyant so may well not reach the cloud level in conditions where a reduction in cloud albedo is likely. This point needs to be discussed. This study does have considerable interest for the general topic of cloud aerosol interaction extending beyond any geo-engineering application a point which needs to be made.

>> **Response**: The following has been added: "While the present study has been motivated predominantly by gaining a more thorough understanding of the response of marine stratocumulus to perturbations in aerosol concentrations, it has obvious implications in terms of marine cloud brightening geo-engineering. There are some important differences, however; when the boundary layer is well-mixed the buoyancy of ship exhaust may increase the amount of ship effluent entering the overlying clouds (Liu et al. 2000), whereas the surface generation of sea-salt particles, as demonstrated in the ship wake observations of Durkee et al. (2000), lead to a plume that is largely neutrally buoyant. The extent to which the added buoyancy from the plume aids in ship track formation is confounded by the observations from Hobbs et al. (2000) which demonstrate that the heat and moisture associated with ship exhaust dissipate rapidly into the boundary layer. Thus, the efficiency of vertical transport of a plume of sea salt aerosol, under a variety of conditions, needs to be considered in the design of a geo-engineering strategy."

Fig 1: there is no indication of ambient wind - is it low and hence unimportant – then say so (quantitatively)

>> **Response**: The ambient wind speed ranges from 2.5 to 10 m s^{-1} in these four cases. The wind speed is lower in RF18 and 24 (2.5 and 5.5 m s^{-1}, respectively), where negative albedo responses were observed. Stronger wind speed was measured in RF19 and 20 (9.5 and 10 m s^{-1}, respectively), where positive albedo responses occurred. Weaker wind is associated with smaller latent heat flux from the ocean surface, and thus less moisture supply to the boundary layer (Chen et al., 2011). This may partially contribute to the negative cloud albedo response as the cloud gets drier through entrainment, yet does not accumulate moisture through the mixing. Also, wind speed affects the concentration and sizes of giant and ultragiant aerosols through wave breaking, and thus plays a role in determining precipitation flux in marine stratocumulus (Jensen and Lee, 2008).