

***Interactive comment on* “Effects of sea surface winds on marine aerosols characteristics and impacts on longwave radiative forcing over the Arabian Sea” by Vijayakumar S. Nair et al.**

Anonymous Referee #3

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This manuscript describes the measurements of aerosol characteristics over Arabian Sea. The change of aerosol mass, number and optical depth are presented relative to wind speed. The aerosol direct radiative forcing in shortwave and long wave is calculated by using an empirical approach. Since the aerosol observations are currently still very limited, especially aerosol size distribution and chemical composition, the measurement like this manuscript presents is very useful.

The weakness of this manuscript is that it does not provide much new results on the aerosol information over this region. The strong dependence of sea salt production on wind speed has already been well known, and the change of wind speed will therefore

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modify aerosol size distribution and aerosol optical depth. The manuscript presents black carbon and total aerosol mass and does not present some measurements for other aerosols, i.e. sea salt, sulfate and dust, so the mixture state of aerosol is presumably prescribed by the authors, which will affect the results of calculated radiative forcing. The main conclusion "the consequent increase in the long wave direct radiative forcing almost entirely offsets the corresponding increase in the short wave direct radiative forcing (or even overcompensates) at the top of atmosphere" in abstract seems problematic. As the results in Fig 16, the short wave forcing is much higher than long wave forcing in both cases. Thus, it is suggested that more analysis should be involved, e.g. aerosol composition, hygroscopic growth, and the conclusive statements should be presented with some caution.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 15855, 2008.

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