

Development of global Aeolian dust model(Masingar) and forecast experiment of Kosa

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Most part of atmospheric aerosol is an aeolian dust from soil surface in dry or semi-dry area. Sahara desert is biggest one of dry area over all globes and very much amount of dust emitted and transports it over Atlantic sea or South America. From March to May, in western part of Japan yellow sand from a desert area in China comes. It is named as Kosa in which visibility is decreased on that time. In these years(2000-2003), Kosa phenomena is widely observed in Japan and explanation of the reason for this increasing is discussed.

To estimate how much amount of soil dust emitted to the atmosphere and how far the dust transported, our group is developing global scale aeolian dust model. To get a precise meteorological field, we use a general atmospheric circulation model developed by co-project between MRI and Japan meteorological Agency (MJ98). Usually T42 version is used, but any horizontal resolution is available with a computer power. Near future this model will be used for operational Kosa forecasting with T106.

Suspension scheme is relatively simple proposed by Gillete(1978). To evaluate radiation effect on solar radiation, dust particle is divided 10 bins from 0.1 micrometer to 10 micrometer.

We have done a real time forecast experiment for dust season in 2002. Results were good when and where dust event was generating and dust aerosol was transported and reached. But, comparing a radiometer observation, density was not so good. There are several reasons for this deficit. One is that it is not so good of surface ground condition, which is very important factor of soil dust emission. Other one is in the wind filed which is also very important factor for dust emission. At now we are reconstructing the ground surface data based on the more high resolved analyzed data. If wind field were bad, how to parameterize the sub grid scale effect for coarse model such as T42 is now analyze detail wind field over Tarim basin by using regional model.