



Modelling the fine and coarse fraction of heavy metals in Spain

Marta García Vivanco and M. Angeles González
CIEMAT, Madrid, Spain

Abstract:

Heavy metals, such as cadmium, lead, nickel, arsenic, copper, chrome, zinc and selenium, are present in the air due to natural and anthropogenic emissions, normally joined to particles. These metals can affect life organisms via inhalation or ingestion, causing damages in human health and ecosystems. Small particles are inhaled and embedded in lungs and alveolus more easily than coarse particles.

The CHIMERE model is a eulerian air quality model extensively used in air quality modelling. Metals have been recently included in this model in a special version developed in the CIEMAT (Madrid, Spain) modelling group. Vivanco et al. (2011) and González et al. (2012) showed the model performance for some metals in Spain and Europe. However, in these studies, metals were considered as fine particles. Some studies based on observed heavy metals air concentration indicate the presence of metals also in the coarse fraction, in special for Cu and Zn. For this reason, a new attempt of modelling metals considering a fine (<2.5 micrometres) and coarse (2.5-10 micrometres) fraction has been done. Measurements of metal concentration in PM10, PM2.5 and PM1 recorded in Spain (Fernández-Camacho et al., 2012; Querol et al., 2008) were used to obtain the new metal particle distribution size. Results and the evaluation of the model performance at some minor sites in Spain is presented.

References:

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