



Concurrent measurements of PM and radon daughters during an episode of dust transport from N. Africa

K.N. Grigoropoulos (1, 2), G.Feredinos (2), P.T. Nastos (3) G.Stefanopoulos(2) and E.Gerasopoulos (4)

1: Social Security Institute, of Neos Kosmos, (IKA) M.Analatu 1, GR 11744, Athens, Greece

2: University of Patras, Department of Geology, GR 26500, Patra, Greece

3: University of Athens, Laboratory of Climatology and Atmospheric Environment, University Campus, Zografou, GR 15236 Athens, Greece

4: National Observatory of Athens, Institute of Environmental Research & Sustainable Development, I. Metaxa & V. Pavlou, GR 15236 Penteli, Athens, Greece

ABSTRACT

In this work we have been monitoring PM fractions (1, 2.5, and 10 μm) together with Radon daughters (^{218}Po , ^{214}Po) in Athens and great periphery during an episode of dust transport from N. Africa on April 2006. These values were compared against average values obtained during larger periods. In particular, Radon daughters are continuously monitored since June 2003 and about five thousand samples of PM have been sampled in 2006. An active radon detector (a-spectroscopy) and a PM detector (light scattering, MetOne Instruments, US.) were used for the above measurements. The PM_{10} concentrations during this day ranged between 1300-1700 $\mu\text{g m}^{-3}$, exceeding by far the international safety limits standards, while at the same time radon daughters exceeded the daily normal levels. This could be associated to radioactivity carried within the dust load or to trapping of ground emanated radon by the dust umbrella in the boundary layer. The presence of enhanced levels of PM in urban environments is linked directly with the epidemiological status of the inhabitants especially in the respiratory tract morbidity. Lethal cases and several clinical / pathological disorders, like heart infarcts, bronchial asthma, acute respiratory infections and arrhythmias have increased the index of our city. An attempt to identify the increase of admissions at the emergency daily ambulatories during the event was also attempted.