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BOOK OF ABSTRACTS AND PROGRAM

COLLERONI FRUTTA DI SICILIA

ANALYSIS OF ^{7}BE AND ^{210}PB CONCENTRATION AND ^{7}BE/^{210}PB ACTIVITY RATIO IN GROUND LEVEL AIR AT PALERMO (ITALY)

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The results of the measurements, carried out almost daily, of the concentrations in the air in Palermo of ^{7}Be (1982-2005) and ^{210}Pb (1995-2005) are analyzed and discussed. With regard to the period of joint availability of data in order to highlight possible correlations between the two radionuclides and with local weather and climate data, the trend of the activity ratios of the two radionuclides whose origin is different was examined.
Beryllium-7 is the product of the interaction of cosmic rays with nitrogen and oxygen nuclei. Its cosmogenic origin makes the measured concentrations strongly dependent on the geographical position and seasonal cycles. It emits 478 keV gamma photons and has a half-life of about 53 days.
Lead-210 (half-life 22.3 years) is instead a decay product of the radioactive family of the ^{238}U. The specific activities of this radionuclide are therefore strongly dependent on the detection site. Its 46.5 keV gamma emission makes it necessary to use a detector suitable for low energies. With the availability of a planar HPGe detector, with a good efficiency for the direct measurement of the 46.5 keV gamma emission, ^{210}Pb activity measurements were again performed on the same samples.
Regarding the statistical analysis, the time series (integrating them for the missing data) were reconstructed for the monthly and weekly average values in order to make homogeneous comparisons with available data from other geographical areas. The correlations between the data series for the two radionuclides were studied and the frequency analysis was carried out in order to highlight seasonal cycles.
The analyzes carried out show the importance of atmospheric transport processes and the influence of meteorological and climatic parameters (in particular temperature and rainfall) in determining the concentrations in air of both radionuclides.