



Cosmic Rays and Climate Change

A.D. Erlykin (1,2), B.A. Laken (3), T. Sloan (4), and A.W. Wolfendale (1)

(1) Physics Department, Durham University, UK (a.w.wolfendale@durham.ac.uk), (2) P.N. Lebedev Institute, Moscow, Russia, (3) Geography Department, Sussex University, UK, (4) Physics Department, Lancaster University, UK

A survey is made of the evidence for and against the hypothesis that cosmic rays affect cloud cover and thereby surface temperature. The analysis is made for the troposphere in the main and it includes correlations of cloud cover with cosmic ray intensity, Forbush decreases, cosmic ray short period increases and eleven year changes; also included are the electrical effects associated with cosmic rays. A complementary study comprises a search for extra cloud cover associated with terrestrial radon emissions, the Chernobyl accident and nuclear bomb tests.

It is concluded that the best estimate of the fraction of (low) cloud cover attributable to a 2% change in cosmic ray intensity is about 0.02%.

Insofar as the maximum change in average cosmic ray intensity over the last 50 years is about 0.2%, no more than 0.01% of cloud cover change in this period can have been caused by cosmic rays; their contribution to Global Warming is thus considered to be negligible.

Not surprisingly, we find that the effect of cosmic rays on stratospheric cloud is bigger, by a factor of at least ten.

In both the troposphere and the stratosphere the cosmic ray effects at the Poles are bigger than average.