

## **Improving the CARI Dose Rate Calculations During Forbush Decreases**

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Software to estimate the radiation exposure of aircrew and passengers during jet flights has been developed over many years. The US FAA CARI 6 software ([http://www.cami.jcbbi.gov/AAM-600/Radiation/radio\\_CARI6.htm](http://www.cami.jcbbi.gov/AAM-600/Radiation/radio_CARI6.htm)) is one example. This code uses an estimate of the cosmic ray environment in the inner solar system at the time under consideration and this environment varies throughout the solar cycle. The estimate is made using a parameter known as the heliospheric potential (or modulation parameter). The heliospheric potential is an average measure of the overall modulation of cosmic rays in the inner solar system. A problem arises when there has been a transient decrease (Forbush Decrease) in the cosmic ray flux at earth due to the passage of a coronal mass ejection and shock front. At these times the heliospheric potential gives a poor representation of the near earth cosmic ray environment. In this paper we present in-situ aircraft dose measurements along identical flight paths during the large Forbush Decrease of October 2003 and during a quiet period in January 2004. These measurements are compared with CARI dose predictions for the flights. We discuss possible alternative derivations of the potential at such disturbed times to derive more realistic dose estimates from the CARI code.