



Cosmic Radiation During Flights

Earth and its inhabitants are constantly showered by radiation from space, like a steady drizzle of rain. This shower of cosmic radiation is created by charged, “sub-atomic particles” (parts of atoms) that originate in our galaxy, other galaxies, and the sun. The particles interact with Earth’s atmosphere and magnetic field to create cosmic radiation.

The charged particles exhibit a wide range of energies and the rate at which cosmic rays bombard Earth depends on whether they are low- or high-energy. The vast majority of cosmic rays are low-energy. Although, high-energy cosmic particles constantly pass through and sometimes interact with our body, they are very rare and very difficult to detect.

About eight percent of our annual radiation exposure comes from outer space. The atmosphere shields us from cosmic radiation, and the more air that is between us and outer space, the more shielding we have. The closer we get to outer space, the more we are exposed to cosmic radiation. This holds true when we live at high altitudes or fly.

Our exposure to cosmic radiation partially depends on the elevation of where we live. For example, people who live in Denver, Colorado, which is more than 5,000 feet above sea level, are exposed to more cosmic radiation than people living in Chicago, Illinois, which is only about 700 feet above sea level. For the same reasons described above, we are exposed to higher levels of cosmic radiation when we fly on a commercial airplane.

The amount of cosmic radiation you are exposed to while flying depends on your altitude and latitude (distance from the Earth’s equator) and solar activity. For a typical cross-country flight in a commercial airplane, you are likely to receive 2 to 5 millirem (mrem) of radiation, less than half the radiation dose you receive from a chest x-ray. People in the United States receive an average of 360 mrem of radiation per year from natural and man-made radiation sources, which includes cosmic radiation exposure during commercial flights.

Who is protecting you

Federal Aviation Administration (FAA)

Solar events, like sun spots, can produce elevated radiation levels at high altitudes and/or latitudes. To prevent increased exposure to cosmic radiation, routine forecasts and alerts are sent through the FAA so that a flight traveling during a solar event can alter its flight plan by reducing altitude. The FAA has developed a computer software program for public use, entitled CARI-6, which provides an estimated equivalent radiation dose for flights.

What can you do to protect yourself

There are no practical ways to shield yourself from cosmic radiation during a flight you can reduce your exposure while flying by taking shorter flights at lower altitudes. This is often not practical and the risks from cosmic radiation do not warrant changing your travel plans to reduce your exposure.

Resources

You can explore this radiation source further through the resources at the following URL:

<http://www.epa.gov/radtown/cosmic.html#resources>

We provide these resources on-line rather than here so we can keep the links up-to-date.