

Solar activity changes over centuries and millennia inferred from cosmogenic radionuclides such as ^{14}C and ^{10}Be

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Cosmogenic radionuclide records provide the most reliable long-term estimates of past changes in solar activity. The production rate of cosmogenic radionuclides depends on the helio- and geomagnetic shielding of the galactic cosmic rays that enter the Earth's atmosphere. Cosmogenic radionuclides measured e.g. in tree rings in the case of ^{14}C or ice cores in the case of ^{10}Be show distinct changes in the past that can be attributed to the variable solar activity.

Cosmogenic radionuclide records, however, can also be influenced by changes in climate. The identification of such climate-induced changes is crucial for the reliable reconstruction of past changes in solar activity. This is especially important in the discussion about a solar influence on climate since unidentified climate signals could feign a solar influence on climate.

The comparison of different radionuclide records allows the identification of such climatic influences on the radionuclide records and the improvement of the estimates of past changes in solar activity.