



Cosmogenic radionuclides as a synchronisation tool – present status

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Changes in the flux of galactic cosmic rays into Earth's atmosphere produce variations in the production rates of cosmogenic radionuclides. The resulting globally synchronous signal in cosmogenic radionuclide records can be used to compare time scales and synchronise climate records. The most prominent example is the ^{14}C wiggle match dating approach where variations in the atmospheric ^{14}C concentration are used to match climate records and the tree-ring based part of the ^{14}C calibration record. This approach can be extended to other cosmogenic radionuclide records such as ^{10}Be time series provided that the different geochemical behaviour of ^{10}Be and ^{14}C is taken into account.

Here we will present some recent results that illustrate the potential of using cosmogenic radionuclide records for comparing and synchronising different time scales. The focus will be on the last 50000 years where we will show examples how geomagnetic field, solar activity and unusual short-term cosmic ray changes can be used for comparing ice core, tree ring and sediment time scales. We will discuss some unexpected offsets between Greenland ice core and ^{14}C time scale and we will examine how far back in time solar induced ^{10}Be and ^{14}C variations presently can be used to reliably synchronise ice core and ^{14}C time scales.