



## **Climate change through the eyes of radioisotopes**

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Cosmogenic radionuclides can be used to monitor the intensity of stratosphere-troposphere exchange, which varies in accordance with the annual cycle of the global atmospheric circulation (Hadley, Ferrel and Polar cells). Beryllium-7 timeseries indicate the trend of atmospheric cell shift and is therefore linked to several meteorological phenomena. To trace vertical air masses with higher accuracy sodium 22 and beryllium 7 can be used together in a lock-in technique which allows to study progression and speed of atmospheric cells. Data show that the cells are decelerating during the summer period which is extending in time. This is caused by warming of the whole troposphere and increased tropopause height due to rising CO<sub>2</sub> concentrations. Strong changes in tropical tropopause height are a side effect of climate change that can be observed and confirmed through radioisotopes concentrations.

Near-surface measurement of cosmogenic radionuclide can help address outstanding challenges in atmospheric circulation research by integrating a new perspective across the disciplines of environmental radiation monitoring and meteorology.