

Climate change through the eyes of radioisotopes

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Cosmogenic radionuclides beryllium-7 and sodium-22 are known atmospheric tracers and can be used together in a lock-in technique to effectively trace vertical air masses based on surface measurements. This technique 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 CO₂ concentrations. Aestival episodes of persistent high-pressure systems over Europe with low pressure gradients that led to almost stationary thunderstorms are correlated with the observed deceleration of atmospheric cell movement. This demonstrates that ⁷Be and ²²Na can be used as indicators for confirming several side effects of climate change while providing a new modelling tool in seasonal weather forecast.

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