# GENERATION OF RADIOCARBON C-14 IN THE AIR IN CONDITIONS OF THUNDERSTORMS

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The occurrence of lightning is preceded by the fast development of electron avalanche in electric fields with strength of about ~ 300 kV/m [1]. The avalanche growth in number of relativistic electrons ensures an energetic terrestrial gamma-ray bursts, that can ensure the photonuclear reactions on atmospheric isotopes with significant cross sections: so, for $E_\gamma$ =20–60 MeV the cross section 14N(γ,n)13N (with $E_{threshold}$ ~10.55 MeV) – within the interval (1–10) mb. In turn the neutron flux leads to generation of radiocarbon 14N(n,p)14C, 40Ar(n,γ)41Ar, 14N(n,alpha)11B, 14N(n,γ)15N and another reactions [2, 3].

It was proposed the spherical-layer-model for calculation of radiocarbon C-14 (knowledge of which generation is exclusively important for radiochronology) and other isotope production in the air under thunderstorms. The simulation was realized at the several altitudes of the lower part of the atmosphere at the altitudes: 1, 3, 5, 7, 10, 13 and 15 km. The atmospheric density dependence is taken into account in the model. It was obtained that yield of radiocarbon C-14 cannot compete not only with it cosmogenic production (but it also significantly lower compared to the yield from Sun irradiation) that allows to take off the problematic question on it significant yield to the total production in the Earth atmosphere under thunderstorms.

At the same assumption it was obtained the rate of radioactive 41Ar production which less than radiocarbon C-14 yield in about $10^3$ times.

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