Contribution ID: **330** Type: **Oral talk (15 min + 5 min questions)**

USING THE TAGGED NEUTRON METHOD FOR DETERMINING THE CONCENTRATION OF CARBON IN SOIL

Wednesday, 13 July 2022 15:40 (20 minutes)

Monitoring the content of soil organic carbon (SOC) is one of the most important tasks in the field of global climate change, in the development and implementation of measures aimed at reducing greenhouse gas emissions [1].
Existing methods of soil analysis [2] mainly involve the selection of bulk samples and work in the laboratory, which leads to a significant complication of obtaining analytical results, to additional use of human and time resources, and in some cases to the unreliability and insufficient accuracy of the data obtained.
The tagged neutron method (TNM) [3, 4] can be used for fast nondestructive elemental analysis of various substances and materials, in particular, without sampling. The method uses neutrons with an energy of 14.1 MeV, which have a high penetrating power. An important advantage of the method is the possibility of using portable tagged neutron generators, which makes it possible to carry out field measurements.
We present some results of test measurements and model simulations, which will help to assess the accuracy limits of the method in terms of reproducibility and repeatability of determining the carbon content in mock soil samples using TNM.

1. Lal, R.: Soil carbon management and climate change, Carbon Manage., 4 (2013) 439-462, https://doi.org/10.4155/cmt.13.31.
2. England J.R. and Viscarra Rossel R.A., SOIL, 4 (2018) 101-122, https://doi.org/10.5194/soil-4-101-2018.
3. Valkovic V., 14 MeV Neutrons: Physics and Applications. CRC Press: Taylor \& Francis Group; 2016, 481p.
4. Galina Yakubova, Aleksandr Kavetskiy, Stephen A. Prior, H. Allen Torbert, Tagged neutron method for carbon a

The speaker is a student or young scientist

No

Section

1. Applications of nuclear methods in science and technology

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