Contribution ID: **128** Type: **Poster**

P1.62: Estimation of airborne background spectrum using deep denoising autoencoder

Monday, 26 June 2023 15:52 (1 minute)

Airborne gamma-ray survey is widely used to quickly identify the composition of territorial radioelement and the extent of soil contamination due to artificial radioactive isotope over a wide area. Unlike radiation detection on ground, background correction is essential in airborne radiation measurements due to the significant impact of radon in the atmosphere and cosmic-ray.
This study reports on deep denoising autoencoder to extract the features of the spectrum and reconstruct a denoised spectrum for estimation of the airborne background spectrum. Investigations revealed that the proposed method estimated the background spectrum even when there is a change in radon distribution in the atmosphere where a large error of estimation occurs. In addition, the proposed method shows robust estimation of the background spectrum even when the soil was contaminated by unexpected radioactive materials. In particular, in the case of Cs137, the Region of Interest (ROI) overlaps with 609 keV, the main energy of radon and U238, making it difficult to estimate background spectrum with conventional methods. Furthermore, the proposed method is suitable for airborne gamma-ray survey with limited operating time, as it can estimate background spectrum with a low count.
Therefore, the proposed method enables more accurate analysis of radioactive materials on ground by estimating and removing unnecessary airborne background spectrum.

Primary author: Mr KIM, Hojik (Korea Advanced Institute of Science and Technology)

Co-authors: Mr LEE, Sangho (Korea Advanced Institute of Science and Technology); Mr KO, Kilyoung (Korea Advanced Institute of Science and Technology); Mr HWANG, Jisung (Korea Advanced Institute of Science and Technology); Mr KIM, Wonku (Korea Advanced Institute of Science and Technology); Prof. CHO, Gyuseong (Korea Advanced Institute of Science and Technology)

Presenter: Mr LEE, Sangho (Korea Advanced Institute of Science and Technology)

Session Classification: Poster (incl. coffee)