

First Stages on Spectral Classification using Synthetic Datasets.

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X-ray fluorescence (XRF) has been extensively utilized across various disciplines for an extended period. Despite the long-standing availability of fundamental physical parameters associated with the process, the extraction of elemental information from spectra remains

predominantly a manual or algorithmic endeavor, given the spectral variations and inherent complexity in different fields of application. This fact limits the range of applicability of AI.

To address this challenge, we generate plausible look a like macro XRFs spectra out of fundamental X-ray parameters, skipping the intermediate intricate features, treating them as perturbations. Our method features independent components adaptable to diverse fields, instrumentation, and sample types. We generate a large dataset using this approach to train a Fully Connected Neural Network to classify elemental lines in the 0-30 KeV range, from a predetermined selection of elements. We then test the Neural Network on completely experimental data from Aerosol measures.

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