Contribution ID: **11** Type: **not specified**

Modeling Quasar Variability with Self-Organizing Map and Conditional Neural Process

Tuesday 23 July 2024 11:35 (10 minutes)

Modeling of quasar light curves is essential for analyzing the physical processes and structure of the source. The QNPy is a modeling tool based on a conditional neural process, developed specifically for modeling a large number of quasar light curves. This process can be time-consuming and its accuracy, depending on the data set, could vary.
The goal of this research was to determine the effect of prepossessing the quasar light curve data set by clustering with the Self-Organizing Map (SOM) algorithm.
The SOM algorithm was selected for this task since it can capture non-linear and non-stationary variability in quasar light curves by clustering similar light curves based on their intrinsic properties, such as variability amplitude, and time scales of variability. Additionally, SOM works fast, which is essential for preprocessing purposes.
The SOM method was trained and tested with 139 quasar light curves detected by the SWIFT Burst Alert Telescope (9-Month BAT Survey). The results have shown that the classification/clustering of quasar light curves as a means of preprocessing could significantly improve modeling via the QNPy. Future work could be focused on improving the classification process to achieve more optimal results.

Funding request, please specify

Primary authors: RAJU, Aman; KOVAČEVIĆ, Andjelka; ILIĆ, Dragana; ČVOROVIĆ - HAJDINJAK, Iva; POPOVIĆ, Luka; PAVLOVIĆ, Marina

Presenter: ČVOROVIĆ - HAJDINJAK, Iva

Session Classification: AGN variability