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ABSTRACT ONLY

CLASSIFICATION OF PEAKED SPECTRUM SOURCES BY USING NEURAL NETWORKS.

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Compact steep-spectrum sources (CSS), high frequency peakers (HFP), and gigahertz-peaked spectrum sources (GPS) are compact radio sources with a particular intense emission. Morphological studies, dense gas analyses, and surveys suggesting the absence of a halo diffusion emission, has led to the general belief that peaked spectrum sources (PSS) are young AGN (see, Stanghellini et al. 1996, 1997b; Bicknell et al. 1997; Readhead et al. 1996). For this reason, the PSS are considered important objects for studying the evolution AGN at their earliest states. Previously, Torniainen et al. (2008) carried out a study of GPS sources, finding that those sources do not follow a particular morphological classification. Additionally, they found that many blazars with long periods of flaring states are misclassified as GPS, HFP, or CSS, therefore, compromising the simple vision of the galaxy-quasar dualism. For this reason, we endeavour a new classification of PSS by using neural networks to find new insights about their morphological properties. Through clustering methods, we group galaxies that present a set of similar physical properties. In particular, we use self organising maps and growing neural gas networks to make a discrete transformation from a multidimensional data into a discrete 2D manifold. These algorithms respond to the input data by grouping the neurones and specialising them according to the physical properties of the studies galaxies. From that classification, we can obtain valuable information regarding the parent population, the redshift, or the optical counterparts of specific groups of CSS, GPS, and HFP. In addition, we correlate features in different bands of the spectra, and with that, we infer how the radio emission connects with other physical processes occurring within the AGN or in the host galaxy.
Note to the organisers: The present work will be presented in XV LARIM as an oral contribution.