CHRIST
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Notice for the PhD Viva Voce Examination

Ms Ayesha Anjum (Reg. No. 1445203), PhD scholar at CHRIST (Deemed to be University), will defend her PhD thesis at the public viva voce examination on Saturday, 19 June, 2021 at 3.00 pm. The defense will be conducted online on the WebEx Meeting platform.

Title of the Thesis	:	**Classification of Extragalactic Point Sources and Flux Variability Characteristics of Blazars**
Discipline	:	**Physics**
External Examiner (Outside Karnataka)	:	**Dr Shantanu Rastogi** Professor Department of Physics DDU Gorakhpur University Gorakhpur - 273 009, UP
External Examiner (Within Karnataka)	:	**Dr Vijaykumar H Doddamani** Professor Department of Physics Jnanabharathi Campus Bangalore University Bengaluru - 560056 Karnataka
Supervisor	:	**Dr Shivappa B Gudennavar** Professor Department of Physics and Electronics School of Sciences CHRIST (Deemed to be University) Bengaluru – 560029 Karnataka

The faculty members of the Department and the School, interested experts and research scholars of all the branches of research are cordially invited to attend this open viva.

Registrar

Place: Bengaluru
Date: 15 June 2021

ABSTRACT

Spectroscopic classification of different types of astronomical objects in large surveys requires enormous amounts of time. Hence, many attempts have been made using broad band photometric magnitudes to classify the extragalactic sources, such as active galactic nuclei (AGNs), starburst and normal galaxies. With this in view, we have made an attempt to classify a sample of 37,492 point sources into Quasi-Stellar Objects (QSOs), galaxies and stars using template fitting technique using multiwavelength photometric magnitudes from the Sloan Digital Sky Survey (SDSS) and the Galaxy Evolution Explorer (*GALEX*) covering the optical to the far ultraviolet wavebands. UV bands play a crucial role in the classification and characterization of astronomical objects that emit over a wide range of wavelengths. We have achieved the efficiency of 89% for QSOs, 63% for galaxies and 84% for stars. Objects for which spectroscopic data is not available can also be classified using this method.

In this work, we have also focused on flux variability studies of gamma-ray emitting blazars. These blazars are classified into flat spectrum radio quasars (FSRQs), BL Lacertae objects (BL Lacs), low (LSPs), intermediate (ISPs) and high synchrotron peaked blazars (HSPs). Literature revealed that variability studies of gamma-ray emitting blazars are sparse in mid-infrared (MIR) wavebands. We undertook studies on mid-infrared (3.4μm, W1 and 4.6μm, W2 bands) flux variability properties of 1035 gamma-ray emitting blazars (460 FSRQs and 575 BL Lacs) using data from the third catalogue of AGN detected by *Fermi*, and cross-matched with Wide-field Infrared Survey Explorer (*WISE*) over a period of 7 years on both intra-day and long time-scales. Variability of the blazars was characterized by calculating amplitude of variability. FSRQs showed larger amplitude flux variations in both the wavebands compared to BL Lacs. Analysis of intra-day light curves showed an increased duty cycle of variability for BL Lacs than FSRQs in W1 and W2 bands. Among the LSPs, ISPs and HSPs in both the bands, LSPs showed the largest amplitude of flux variability and HSPs the lowest amplitude of flux variations, while ISPs showed the variations intermediate between LSPs and HSPs.

Keywords: QSOs – UV optical photometric classification - point-sources – SDSS - GALEX - SED fitting – Midinfrared variability –Blazars - WISE