

## **A new method of star-galaxy separation from the NIR and MIR AKARI data**

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Aleksandra Solarz, Tsutomu T. Takeuchi (Nagoya Univ.), Agnieszka Pollo (Center for Theoretical Physics of the Polish Academy of Sciences), Tsutomu T. Takeuchi (Nagoya Univ.), Agata Papiak (Jagiellonian Univ.)

It is crucial to develop a method to classify objects detected in deep infrared surveys. In particular a method to separate galaxies from stars using only the infrared information is necessary to study the properties of galaxies without introducing any additional bias. We present the method of star/galaxy separation based on the support vector machines (SVM) in the data from the AKARI North Ecliptic Pole (NEP) Deep survey collected through nine AKARI / IRC bands from 2 to 24  $\mu\text{m}$ , that cover the near- and mid-infrared wavelengths (hereafter NIR and MIR, respectively). To study the distribution of stars and galaxies in the AKARI's multicolour space we define the training samples of these objects by calculating their infrared stellarity parameter (*sgc*). The most efficient classifier is tested against the whole sample, reaching 90% and 98% accuracy in pinpointing galaxies and stars in infrared multicolour space, respectively. Then we confirm the developed separation by creating Euclidean normalised number count plots, and by using auxiliary optical data obtained by Subaru telescope, which show 80% consistency. The developed infrared classifier proves to be very efficient and accurate in selecting both stars and galaxies in deep infrared surveys carried out without any previous target object selection.