

[KST-09] Mass-Loss Rate in Short-Period Cataclysmic Variables

Fedir V. Sirotkin, & Woong-Tae Kim
Seoul National University

The relationship between orbital periods of cataclysmic variables (CV) and mass-loss rates of their donor stars is an important subject of theoretical researches. The observed donor's radii are oversized in comparison with those of isolated unperturbed stars of the same mass, which is thought to be a consequence of the mass-loss. Using the empirical mass-radius relation of CVs and the Hayashi theory for changes in effective temperature, orbital period, and luminosity of the donor with the stellar radius, we find the mass-loss rate of CVs as a function of the orbital period P . The derived mass-loss rate is more or less constant at $10^{-9.6} - 10^{-10} M_{\odot} \text{ yr}^{-1}$ with P above 90 minutes and declines very rapidly with P below 90 minutes, reaching $10^{-10.3} - 10^{-11.7} M_{\odot} \text{ yr}^{-1}$ when P is close to the minimum period. The turnaround behavior of the mass-loss rate shape with P near the minimal period is much less pronounced than suggested by earlier numerical models, making observational detection of the turnaround highly unlikely. When applied to our new results, SDSS 1035, 1507, 1501 and 1433 systems, previously known as post-bounce CVs, are more likely to be systems that have yet to reach the minimal period. This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korean government (MEST), No. 2009-0063616.

[KST-10] Survey of Globular Clusters with the AKARI FIS for the Intracluster Dusts

Jeong hyun Pyo^{1,3}, Woong-Seob Jeong¹, Eun hyeok Kim², Myung Gyoon Lee³,
 Seung Soo Hong³

¹*Korea Astronomy and Space Science Institute*, ²*Department of Astronomy, Yonsei University*, ³*Department of Physics and Astronomy, Seoul National University*

In search of the intracluster dusts, we have made a survey of globular clusters (GCs) with the Far-Infrared Surveyor (FIS) aboard AKARI, the Japanese infrared space satellite. The GCs are thought to host dust particles that are condensed from the material injected by the cluster asymptotic giant branch (AGB) stars. However, attempts to detect dust emission from GCs had not been successful until a significant amount of far-infrared (FIR) emission was detected close to the NGC 7078 center by the ISO observations (Evans et al. 2003). Recent FIR observations by the AKARI (Matsunaga et al. 2008) and the Spitzer Space Telescope (Boyer et al. 2006; Barmby et al. 2009) reported a tentative detection of the dusts in NGC 5024 and NGC 6341, and also confirmed the previous ISO dust detection from NGC 7078. We have observed 17 selected GCs in four FIS wavebands at 65, 90, 140, and 160 micrometers. Each observation covers about $10' \times 10'$ area centered at each GC. The resulting images show extended structures and/or blobs around the GCs. The extended structures are very suggestive of the Galactic cirrus, while the blobs around NGC 288 and NGC 4833 seem to be related to the two clusters. In this presentation, we will report four representative cases of our survey results and discuss the properties of newly detected sources.