

X-RAY SPECTRA AND ATMOSPHERIC STRUCTURES OF BURSTING NEUTRON STARS

TOSHIKAZU EBISUZAKI

Department of Earth Science and Astronomy

College of Arts and Sciences

University of Tokyo

Komaba Meguro-ku, Tokyo 153

ABSTRACT. High quality spectra of Japanese X-ray satellite TENMA permit us detailed studies of X-ray burst on color temperature vs. luminosity diagram. Using this diagram, Sugimoto Ebisuzaki and Hanawa(1984) divided bursts from MXB1636-536 into two classes: bright class and faint class. In the decay phase of bright class bursts, surface of neutron star should be covered with pure helium matter processed on the surface of neutron star because hydrogen-rich matter is completely lost due to mass loss. On the other hand, surface of neutron star should be covered by hydrogen-rich matter in the case of faint class bursts because any mass loss is not driven in the faint class bursts. I constructed color temperature vs. luminosity diagrams of X-ray burst sources MXB1636-536 and MXB1608-522 using data of Japanese X-ray satellite TENMA and found systematic deviations between evolutionary paths of the bright class and faint class bursts on these diagrams. The deviations are successfully accounted for by the difference in chemical composition between bright class and faint class bursts: evolutionary paths of bright class and faint class are respectively in good agreement with theoretical curves for pure helium and hydrogen-rich matter. This is a direct evidence of ejection of hydrogen-rich envelope in the bright class bursts.

REFERENCE

Sugimoto, D., Ebisuzaki, T., and Hanawa, T 1984, Publ. Astron. Soc. Japan, 36, 839.