Double-Peaked Neon and Oxygen Lines from the Accretion Disk in 4U 1626-67

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Abstract

We report on a 40 ks observation of the 7.7-s LMXB pulsar 4U 1626-67 with the Chandra HETGS. This ultracompact system consists of a disk-accreting neutron star and a very low mass hydrogen-depleted companion in a 42-min binary. We have resolved the previously reported Ne/O emission line complex near 1 keV into Doppler pairs of broadened lines from hydrogenic and He-like Ne and O. The lines appear to originate in optically thin material near the surface of the Keplerian accretion disk, or possibly in an accretion disk wind driven from the magnetopause. The observed photoelectric absorption edges of Ne and O are nearly an order of magnitude stronger than expected from the ISM along the line of sight, suggesting that the mass-losing hydrogen-depleted companion in this binary may be a C/O/Ne or O/Ne/Mg white dwarf.

CATEGORY: BLACK HOLE AND NEUTRON STAR BINARIES