The mass of the compact object in the X-ray binary her X-1/HZ her

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Abstract

We have obtained the first estimates of the masses of the components of the Her X-1/HZ Her X-ray binary system taking into account non-LTE effects in the formation of the H γ absorption line: $m_x = 1.8$ M$_\odot$ and $m_v = 2.5$ M$_\odot$. These mass estimates were made in a Roche model based on the observed radial-velocity curve of the optical star, HZ Her. The masses for the X-ray pulsar and optical star obtained for an LTE model lie are $m_x = 0.85 \pm 0.15$ M$_\odot$ and $m_v = 1.87 \pm 0.13$ M$_\odot$. These mass estimates for the components of Her X-1/HZ Her derived from the radial-velocity curve should be considered tentative. Further mass estimates from high-precision observations of the orbital variability of the absorption profiles in a non-LTE model for the atmosphere of the optical component should be made. © 2008 Pleiades Publishing, Ltd.