WHAT TYPE OF BINARY SYSTEM IS CYGNUS X-3 ?

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ABSTRACT. Results of the final analysis of COS-B X-ray observations of Cygnus X-3 (more than 220 days of observations from 1975 to 1982) are presented. Variations of the 4.8h period have been investigated and a new ephemeris including previous and later (Exosat) results, is established. Both long and short-term changes in the period are apparent. The long term variation is found to be consistent with orbital changes expected from mass transfer and mass loss in a standard low-mass binary system with an accreting neutron star. Short term period fluctuations (of the order of $4\ 10^{-3}$ d.) are definitively present and not fully explained.
A critical discussion of the recent claimed high energy gamma ($E > 10^{12}$eV) detections of the source is also presented. It is argued that, if confirmed, these results are inconsistent with the typical X-ray picture of Cygnus X-3. In particular, the eclipse duration required in the Vestrand and Eichler (1982) imply a totally unphysical companion for a 4.8h orbit.

D. J. Helfand and J.-H. Huang (eds.), The Origin and Evolution of Neutron Stars, 550.