



Contribution ID: 33

Type: Poster

Application of the Accretion Torque Model to the X-ray Binary Pulsar A 0535+262

Tuesday, January 28, 2025 4:40 PM (1h 20m)

We studied how the neutron star's spin changes with the mass accretion rate in the X-ray binary pulsar A 0535+262. Using the long-term light curve obtained with the MAXI/GSC and the time variation of the pulse period from the Fermi/GBM, we found a clear anti-correlation between the bolometric luminosity and the period derivative. We applied the accretion torque model proposed by Ghosh and Lamb (1979) to the data. This model predicts the relation between the luminosity and the period derivative considering the physical parameters of the neutron star including the mass and radius, so the application of the model to the data enables us to estimate these parameters. We obtained a neutron star mass of 1.1-1.2 solar mass from the A 0535+262 data. In this presentation, we will present the details of the analysis and results and discuss possible uncertainties in the results produced by the model and the data.

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Session Classification: Poster Presentation