Why this is Important:
- The future evolution of the star will be dramatically affected by the presence of a black hole.
- The outcome is highly contingent on mass and angular momentum conservation, and instabilities.
- The detailed study of companion star to trigger instabilities and provide pathologies for mass and angular momentum exchange.

X-rays as a Key Diagnostic
- X-ray temperatures trace pre-shock wind velocities.
- Periodic X-ray variability traces the orbit.
- X-ray line variations trace the slow re-accretion of the lost mass.

Line Profile Variations from the HETG:

A Model of the Colliding Wind Flow
We modeled the colliding wind flow as a series of cylindrically symmetric rings using:
- the Canto, Raga and Wilkin (1996) wind-wind interaction geometry, with a scale factor to describe the Canto et al. flow velocity in each ring
- emissivity given by
  \[ \frac{\text{d}L}{\text{d}n} = \frac{\text{d}L}{\text{d}n} \text{at} x = \text{peak} \]

where \( x_{\text{peak}} \) is the peak of the emission, and \( L_{\text{peak}} \) the total line luminosity. The line profiles for 3 longitudes of periastron are