

Binaries: Exercise 2.

Figure skaters perform their pirouettes by drawing their feet and/or hands closer to the centre of their axis of rotation. This increases their angular velocity, because the angular momentum of their whole body is conserved. They slow down their rotation by extending their feet and/or hands.

The same happens to stars. When a star evolves away from the main sequence, it expands and becomes a giant. This expansion slows down its rotation. The projected rotation velocities $v \sin i$ of **single** late-type G and K-type giants are typically only a few kilometers per second, and rarely exceed $v \sin i = 10 \text{ km s}^{-1}$.

For some reason, a **single** G2 giant FK Comae Berenices (HD 117555) has a projected rotation velocity $v \sin i \approx 100 \text{ km s}^{-1}$, and a rotation period $P_{\text{rot}} = 2.4$ days. It rotates ten times faster than our own G2 main sequence star, the Sun!

How can this rapid rotation of FK Comae Berenices be explained **in terms of binary star evolution**? Use less than one hundred words in your answer. Give the reference where you obtained this information (Authors, Year, Journal, Volume, Pages).