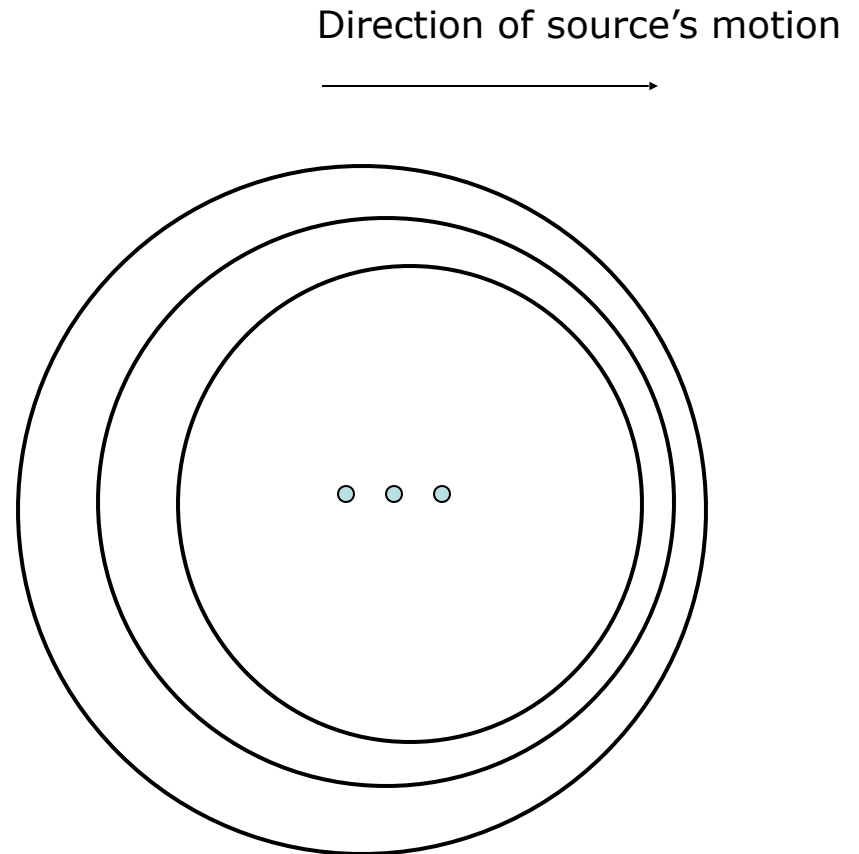


Spectroscopic Binaries...some real data

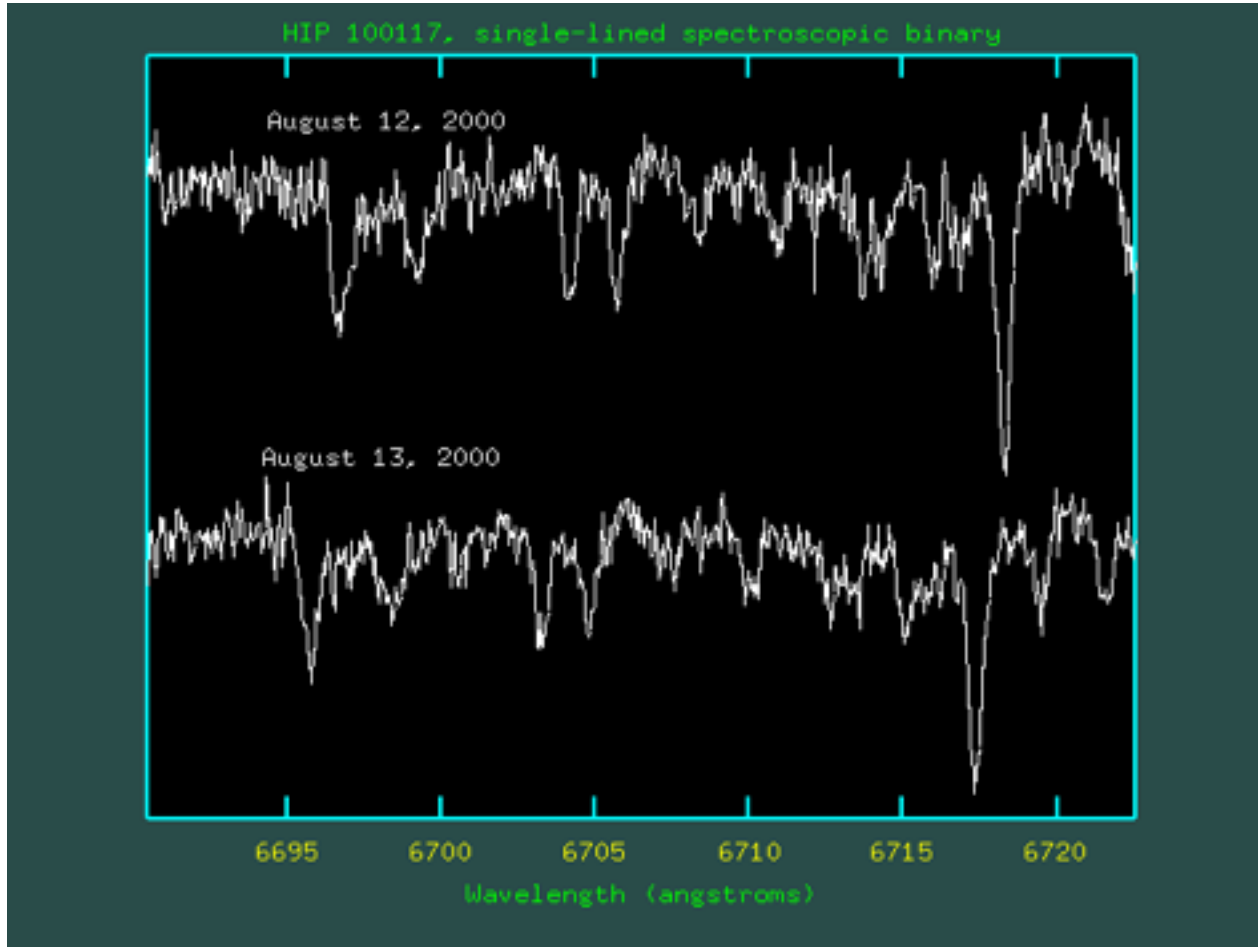
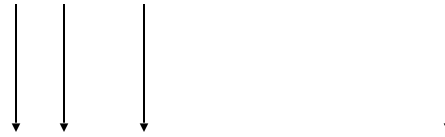
courtesy of Eric Jensen

The Doppler effect is quite simple – waves “pile up” in the direction of motion, as each successive wave is emitted *later*, when the source is closer to the observer.



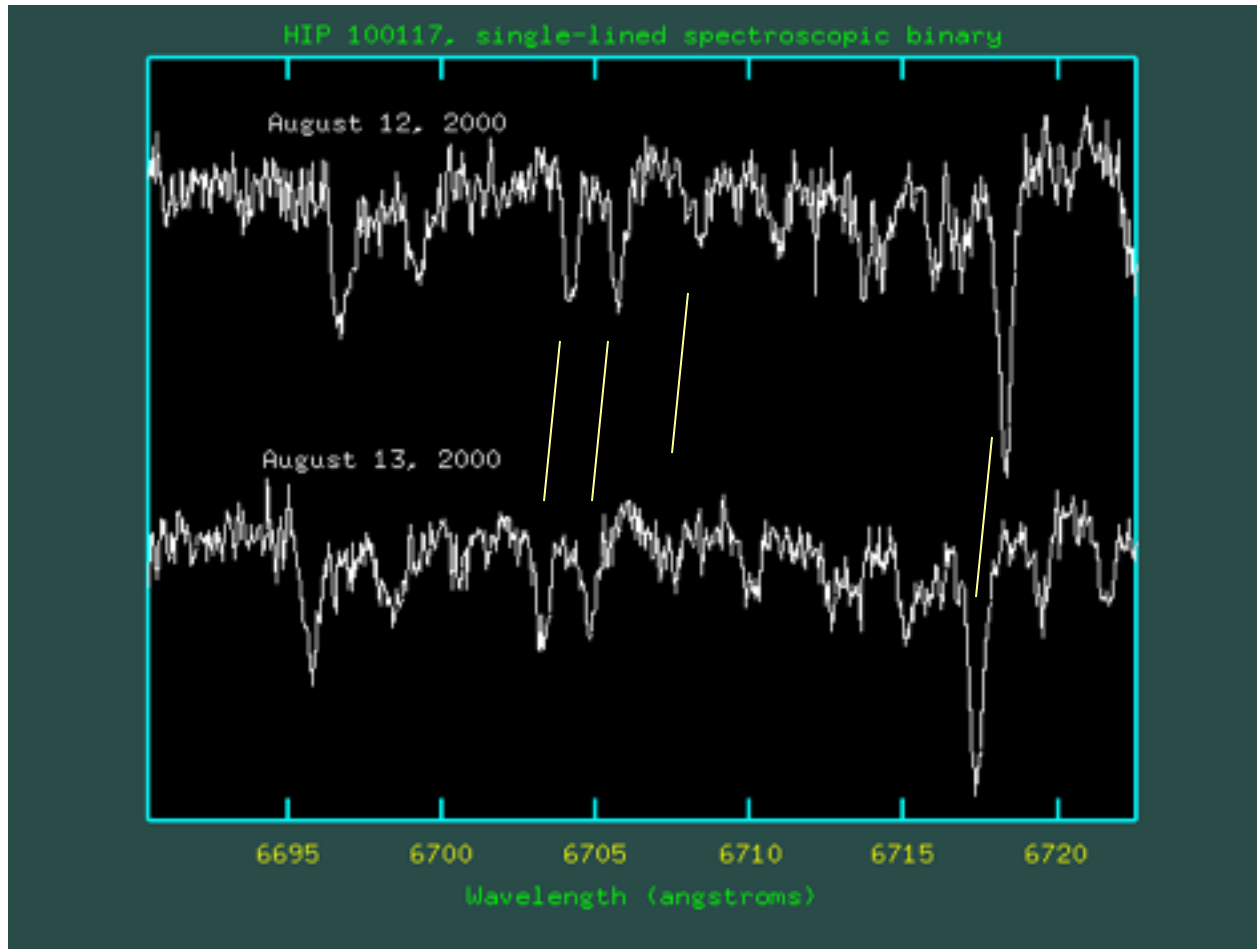
Same star, 2 successive nights

iron lithium calcium



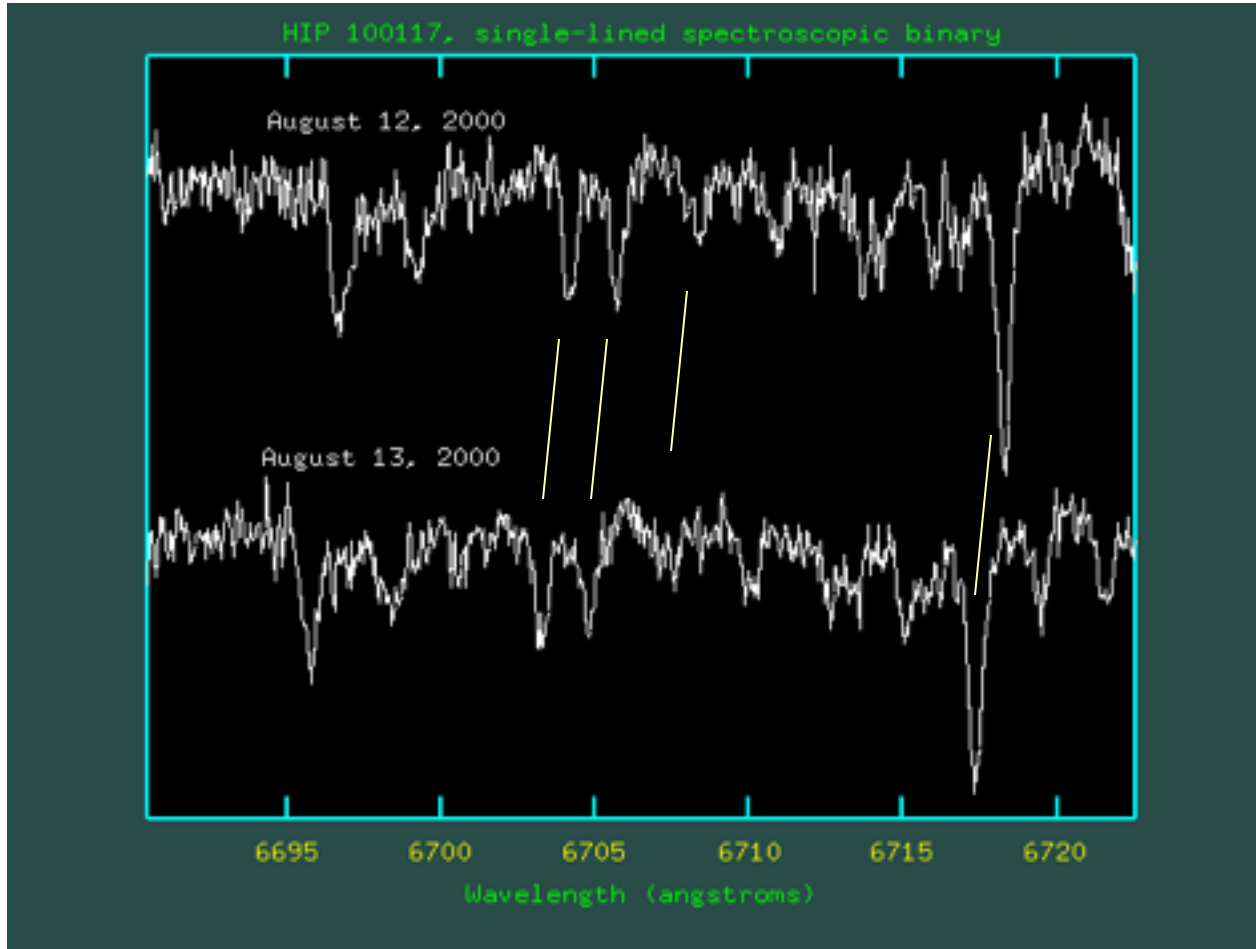
What does it mean that every line shifts to shorter wavelengths from one night to the next?

iron lithium calcium



Does it mean that the star
is *moving*?

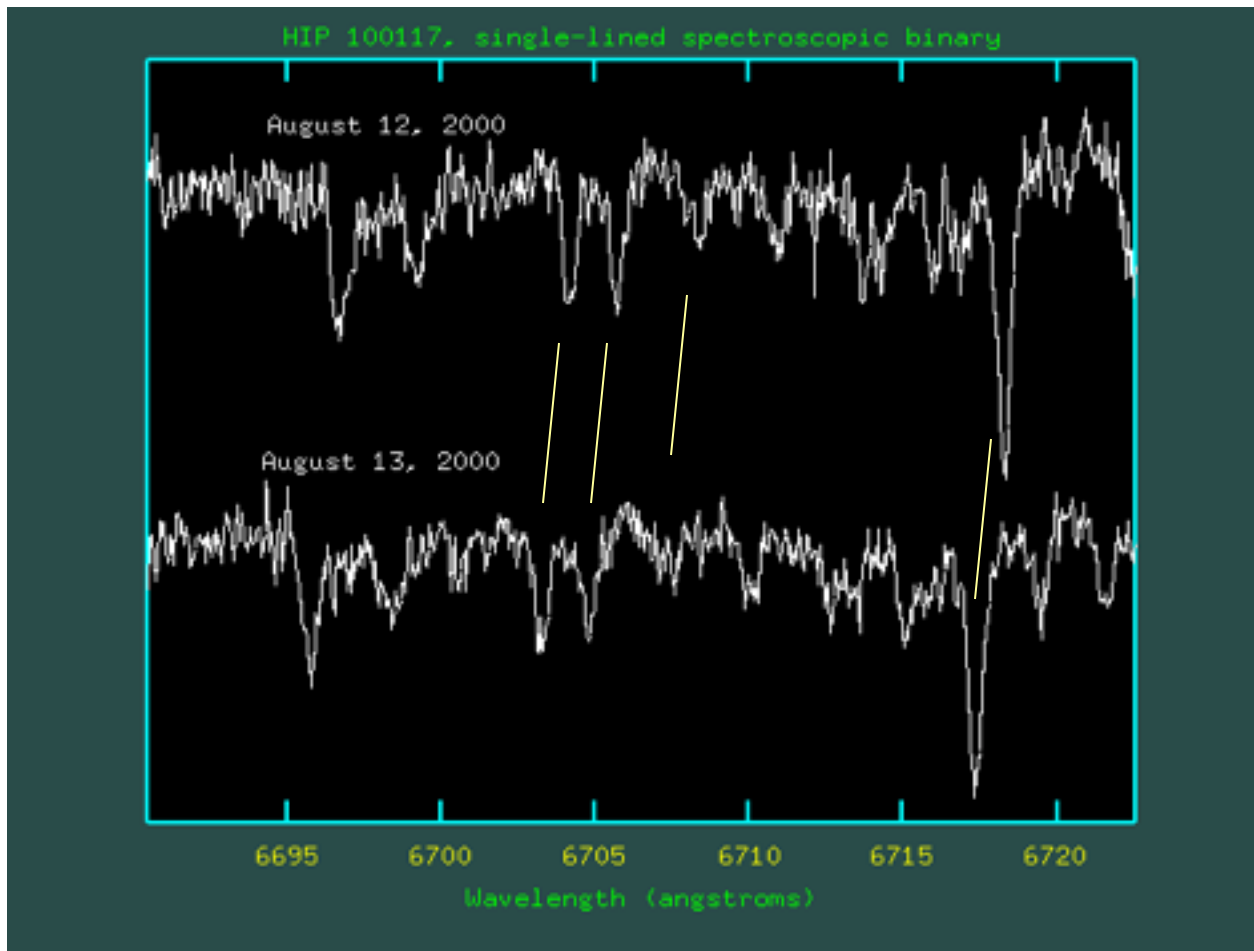
iron lithium calcium



Does it mean that the star
is *moving*?

More – it means that its
speed is **changing** – it is
accelerating.

iron lithium calcium

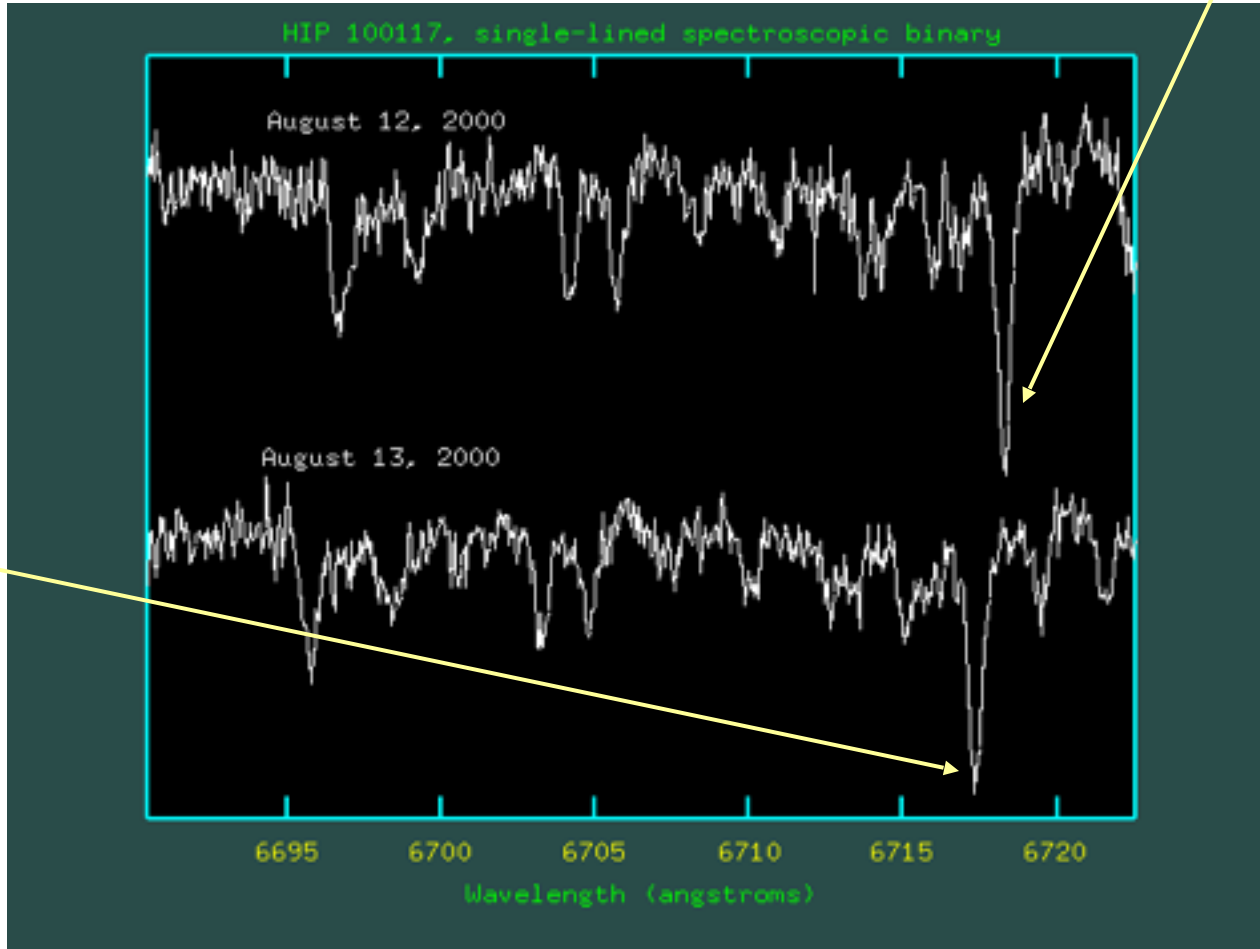


the calcium line has
 $\lambda_{\text{lab}} = 6719.0$ Angstroms

iron lithium calcium

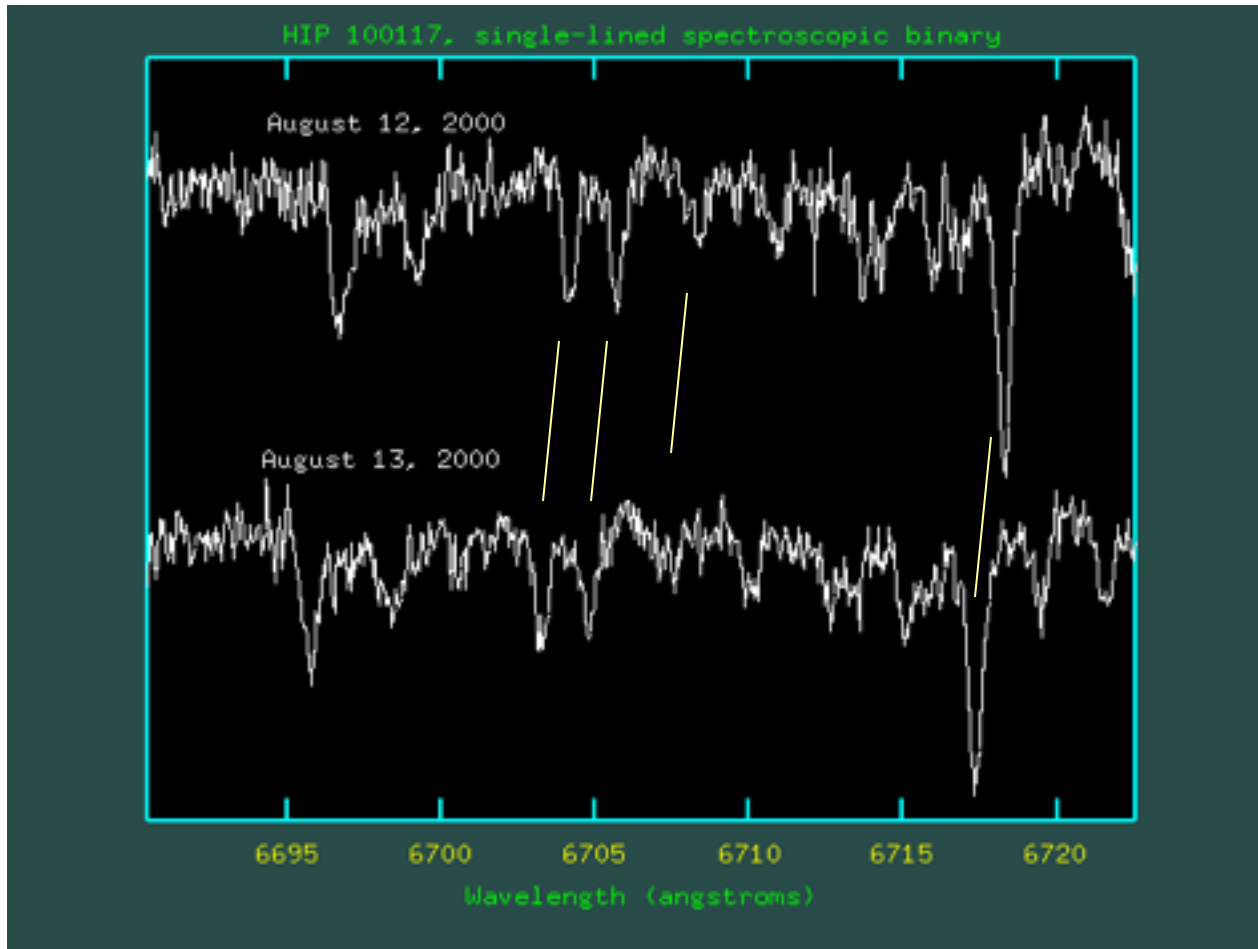
↓ ↓ ↓ ↓

measure λ
 $= 6719.5$ on
August 12

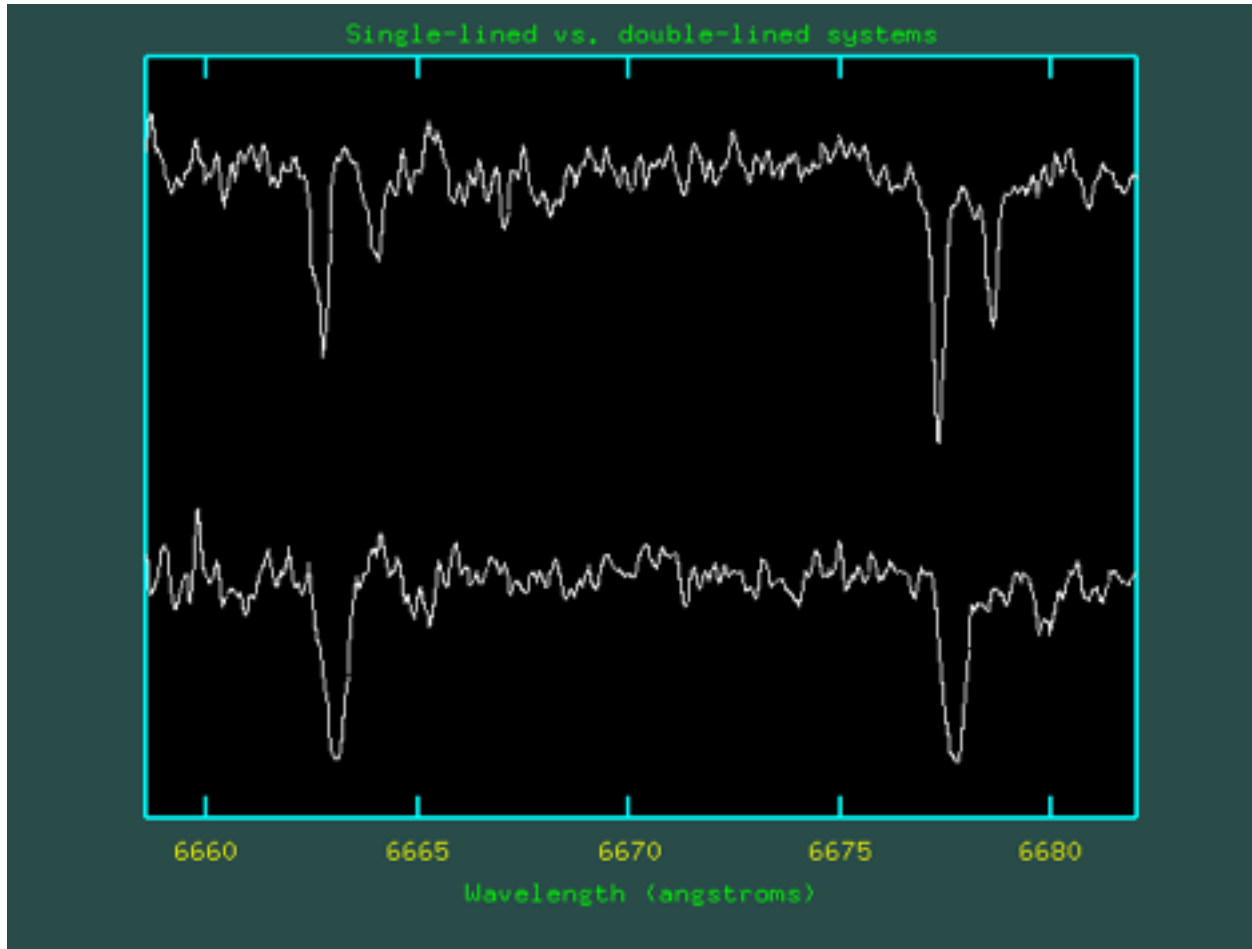


and λ
 $= 6717.2$ on
August 13

20 km/s away from us to 80 km/s toward us in just one day.



A single-line spectroscopic binary (bottom) vs. a double-line spectroscopic binary (top).



The same spectroscopic binary, on two successive nights.

