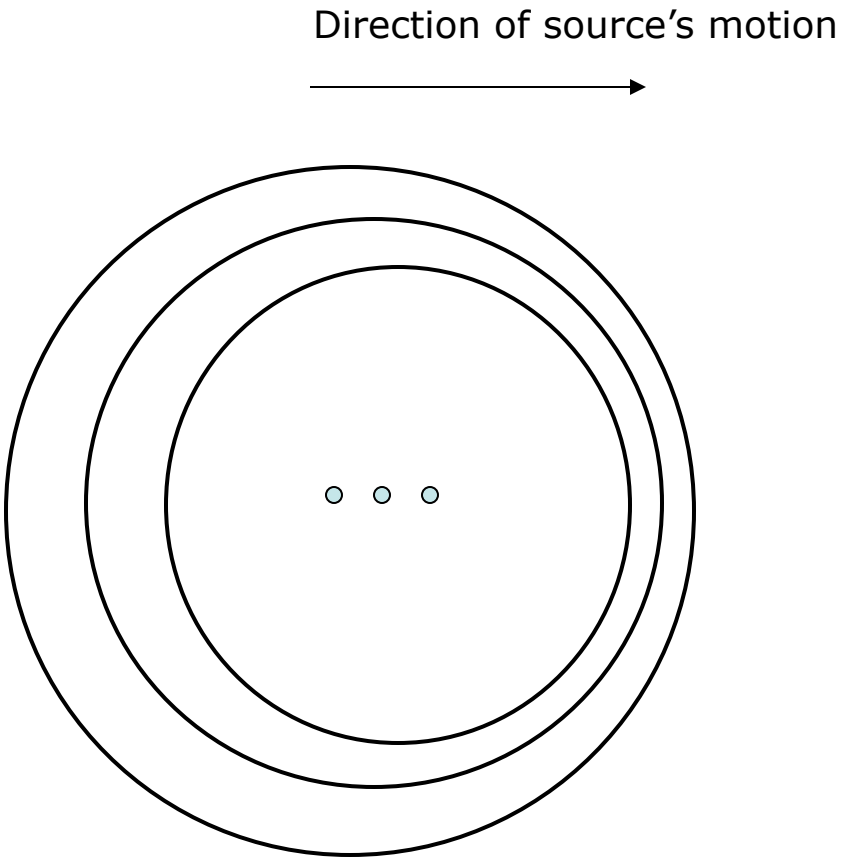
Spectroscopic Binaries…some real data

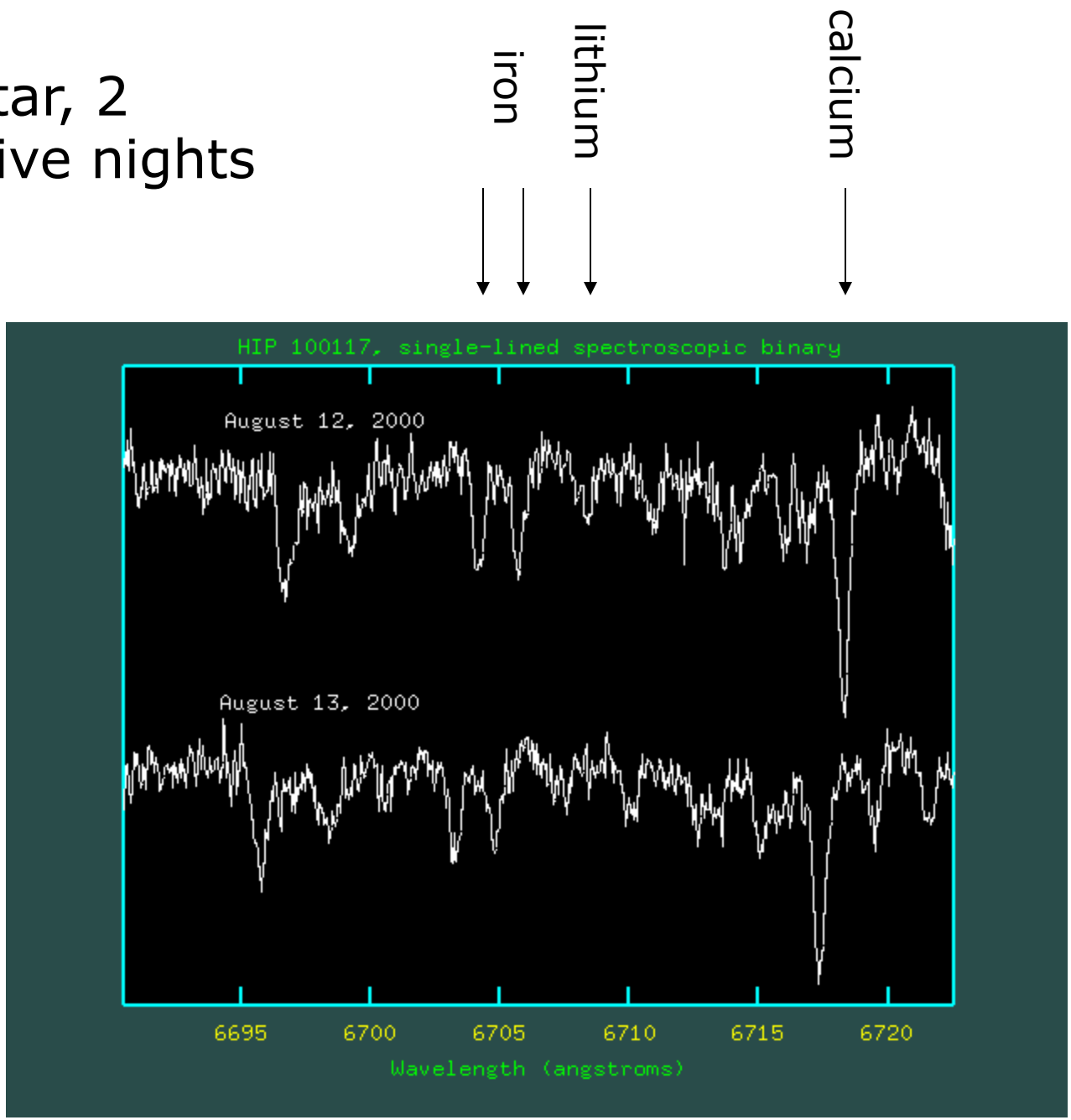
courtesy of Eric Jensen

Note: an Angstrom unit is 1/10 of a nanometer

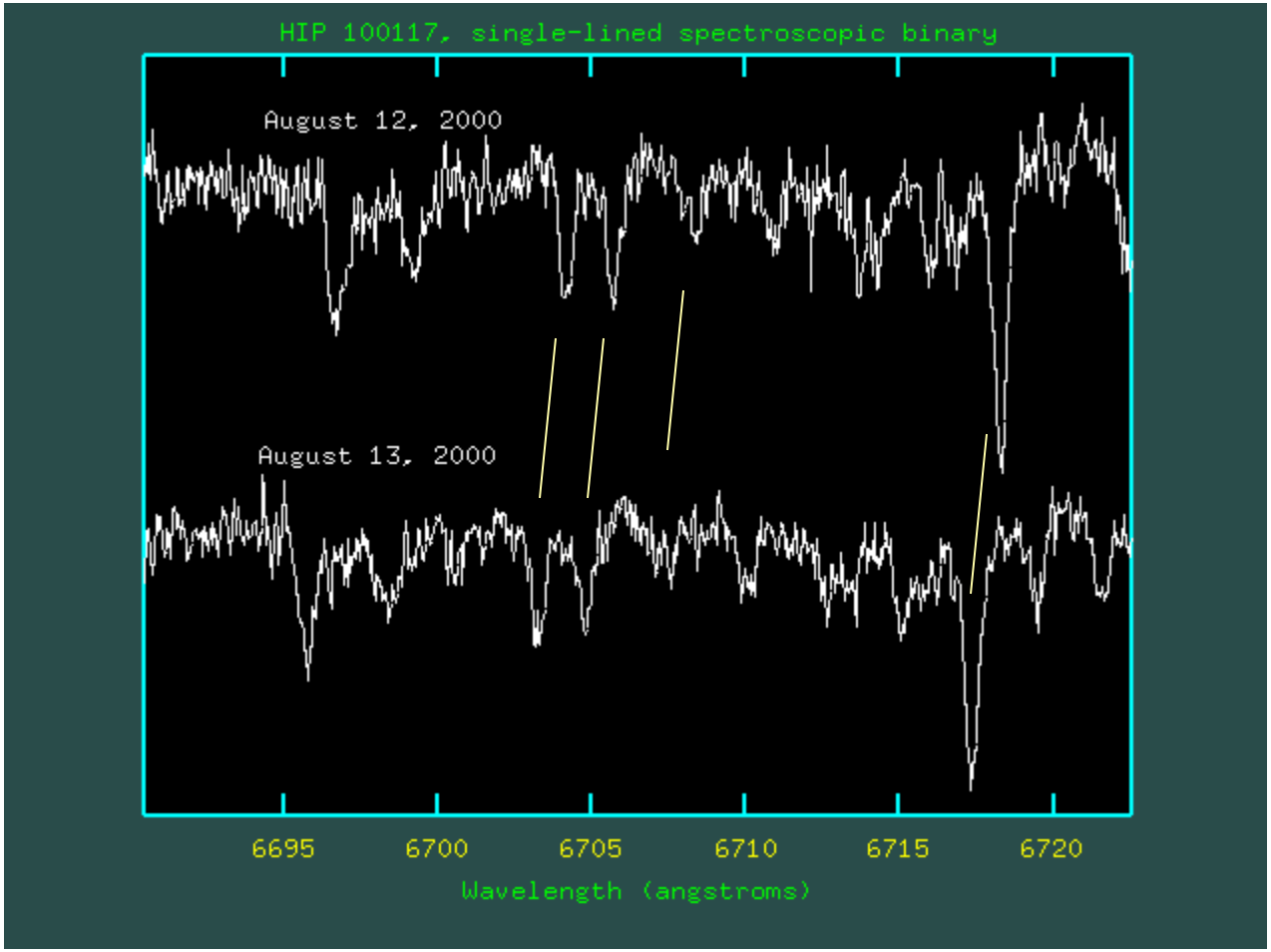
The Doppler effect is quite simple – waves "pile up" in the direction of motion, as each successive wave is emitted *later*, when the source is closer to the observer.



Same star, 2 successive nights

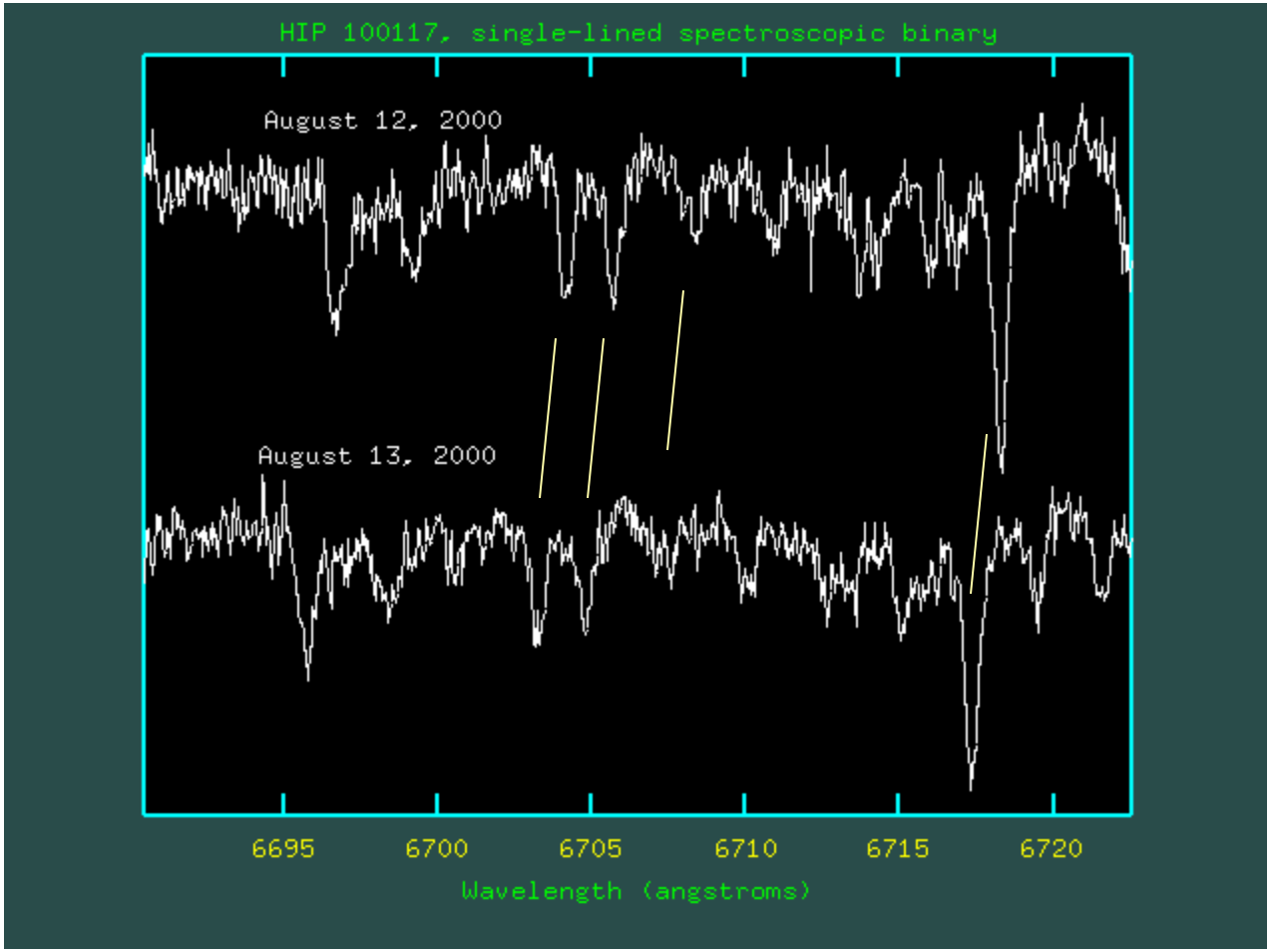


What does it mean that every line shifts to shorter wavelengths from one night to the next?

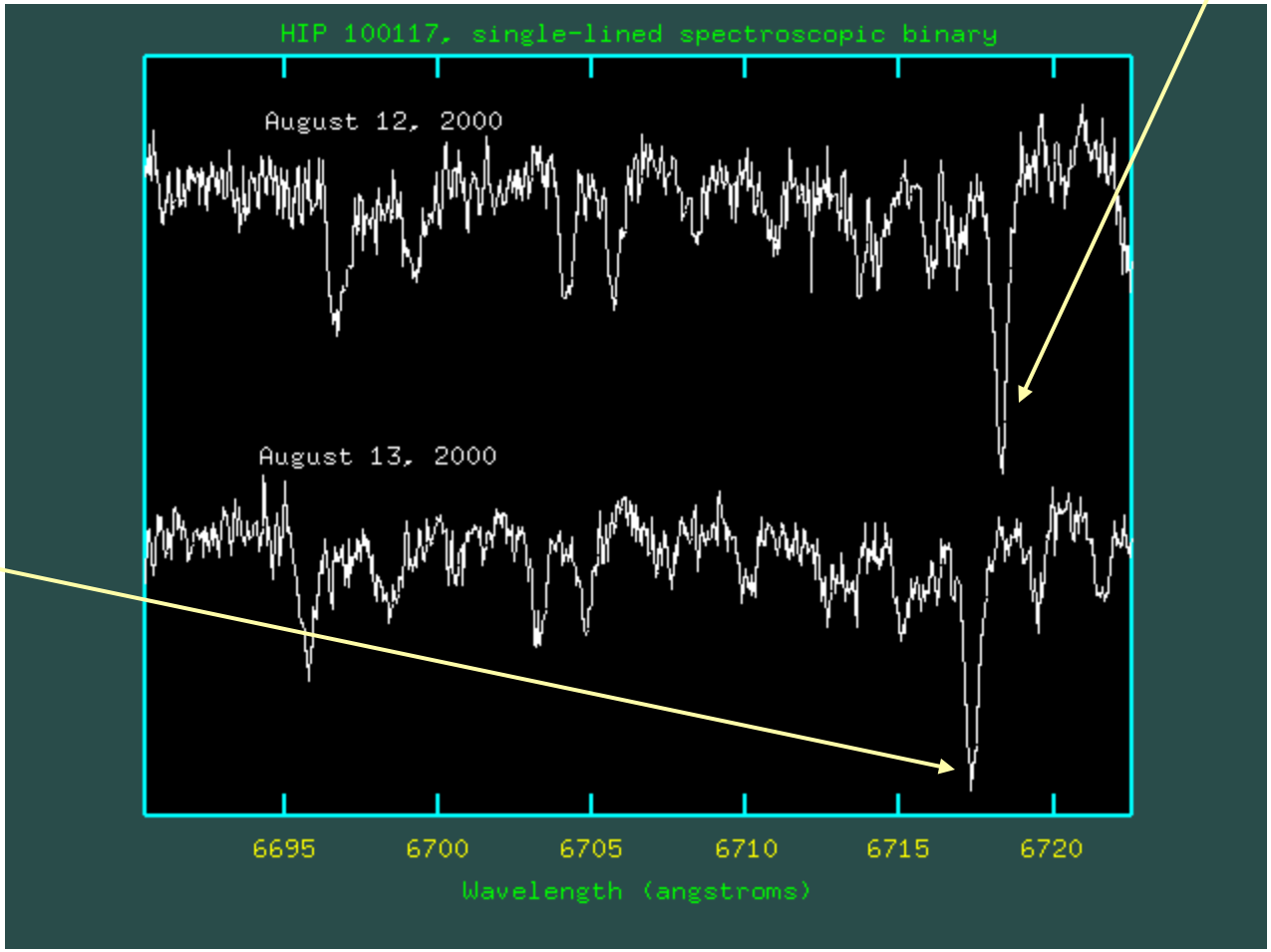


Does it mean that the star is *moving*?

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



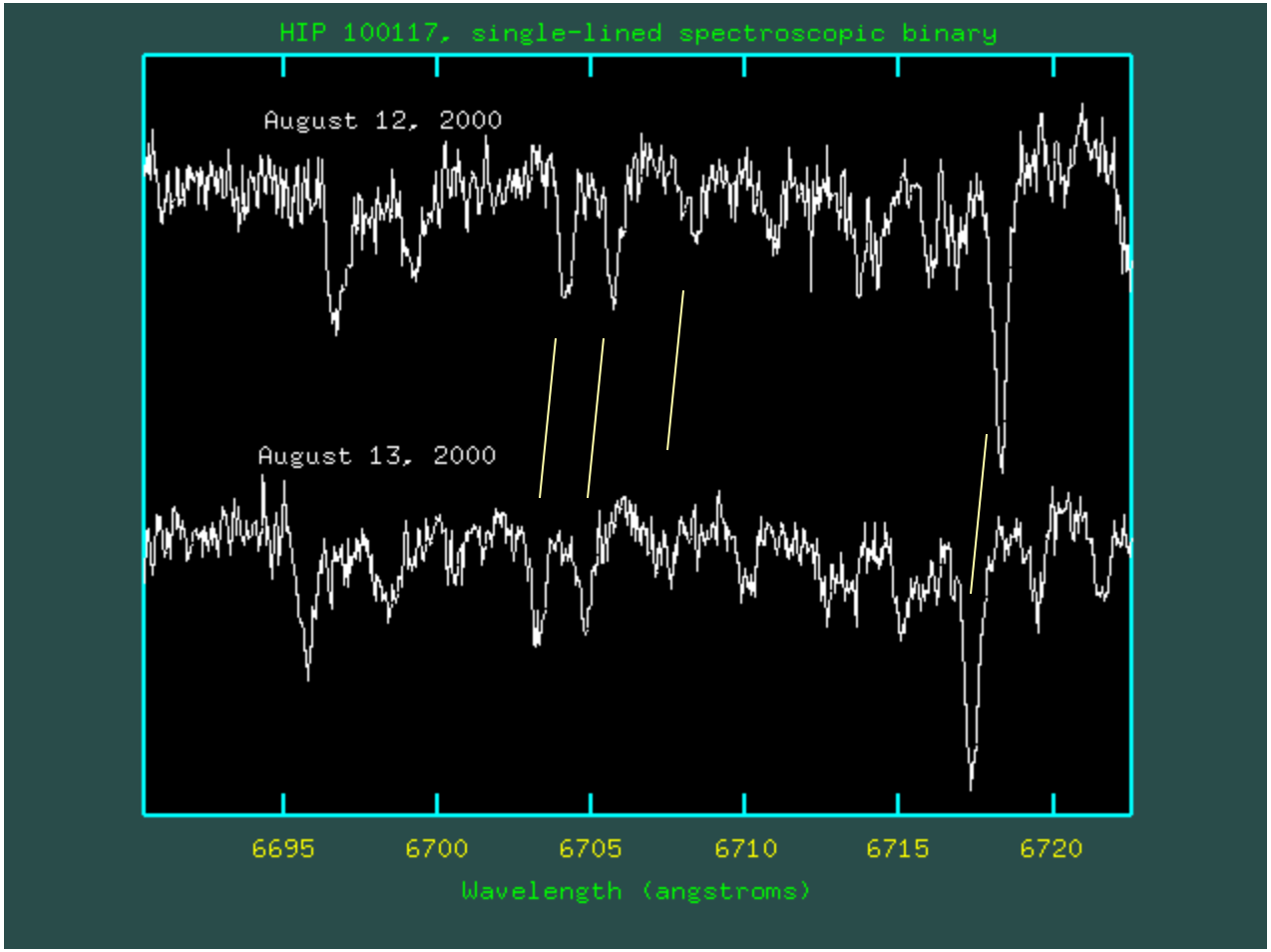
the calcium line has λ_{lab} =6719.0 Angstroms



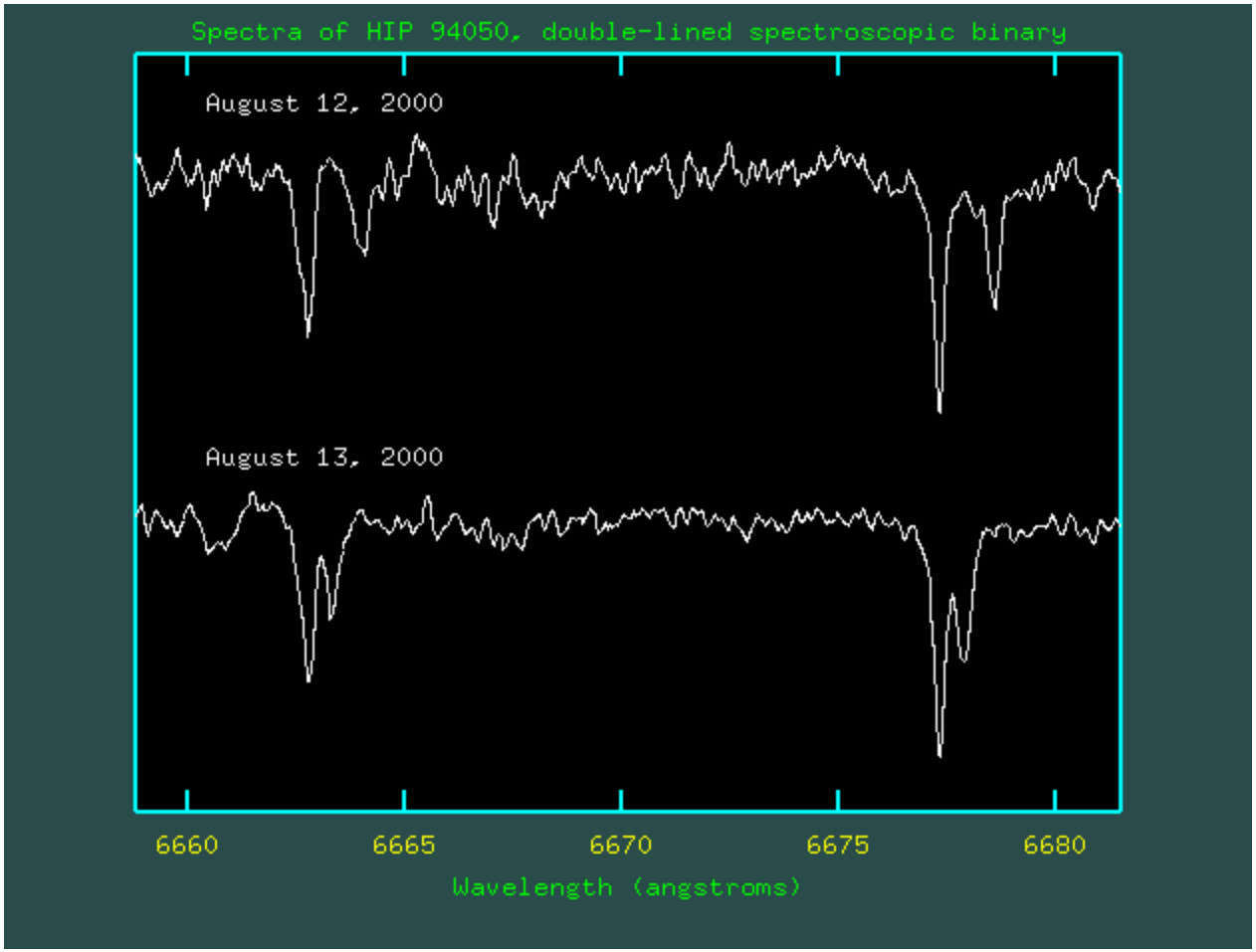
measure λ =6719.5 on August 12

and λ =6717.2 on August 13

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



The same spectroscopic binary, on two successive nights.



A spectroscopic triple system.