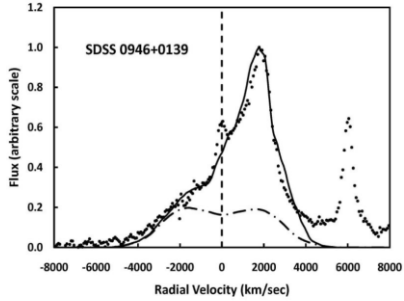
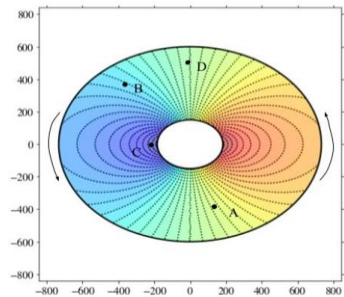
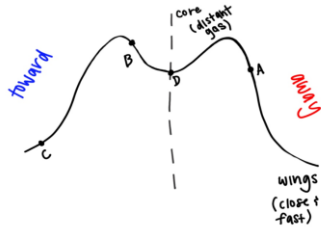


# PARTIAL OBSCURATION AS A CAUSE OF ASYMMETRIES OF BROAD BALMER LINE PROFILES IN ACTIVE GALACTIC NUCLEI

Martin Gaskell, Syna Gogte, Peter Harrington, Grace Tang, and William Zhao



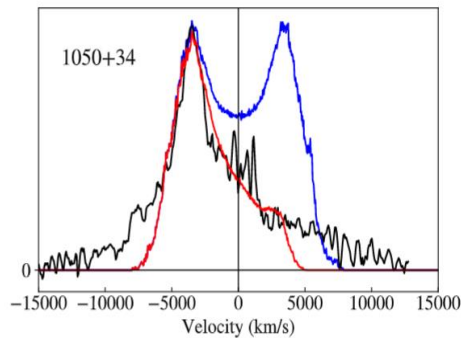
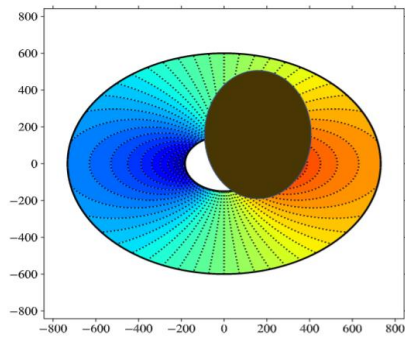
A. Example of an extreme profile



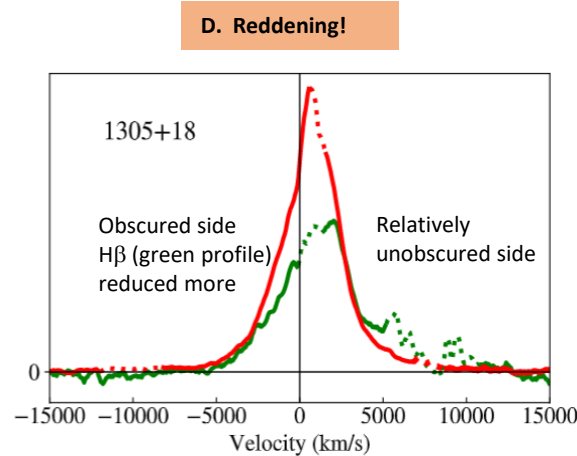
B. How a line profile arises

**ABSTRACT**

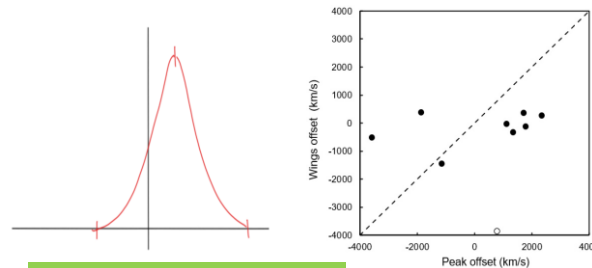
The broad-line region (BLR) consists primarily of dense, turbulent gas in a flattened distribution co-rotating above the accretion disc of an AGN. If the BLR is seen close to face-on, the line profiles should be centrally-peaked, "logarithmic" profiles. At higher inclinations, profiles should become broader and double-peaked. The expected "disc-like" profile is almost never seen in AGNs. Instead, broad double-peaked profiles are usually quite asymmetric. We have studied a sample of the most extreme Balmer line profiles. We find that the profiles and changes in them arise naturally because of partial obscuration of the BLR by outflowing dust clouds. We also see evidence for reddening by a dust cloud.



C. Example of fitting an extreme profile:

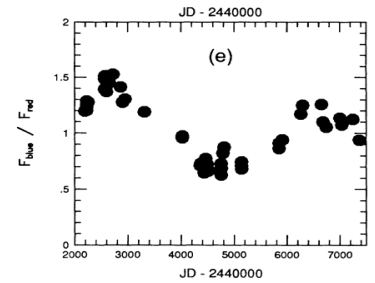


D. Reddening!

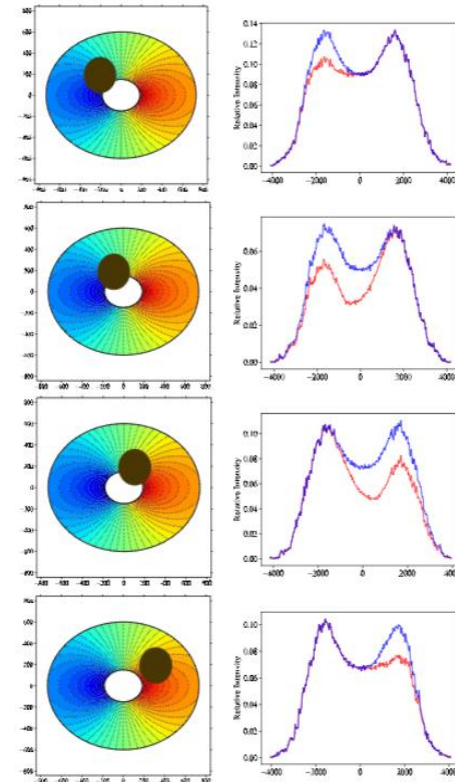


E. Does the whole profile shift like this?

No. Just the peak.



F. Radial velocity changes!



Details: C. M. Gaskell & P. Z. Harrington (2018), *Monthly Notices*, 478, 1660