Modeling light curves of eclipsing binaries with non-circular accretion disks: KU Cyg

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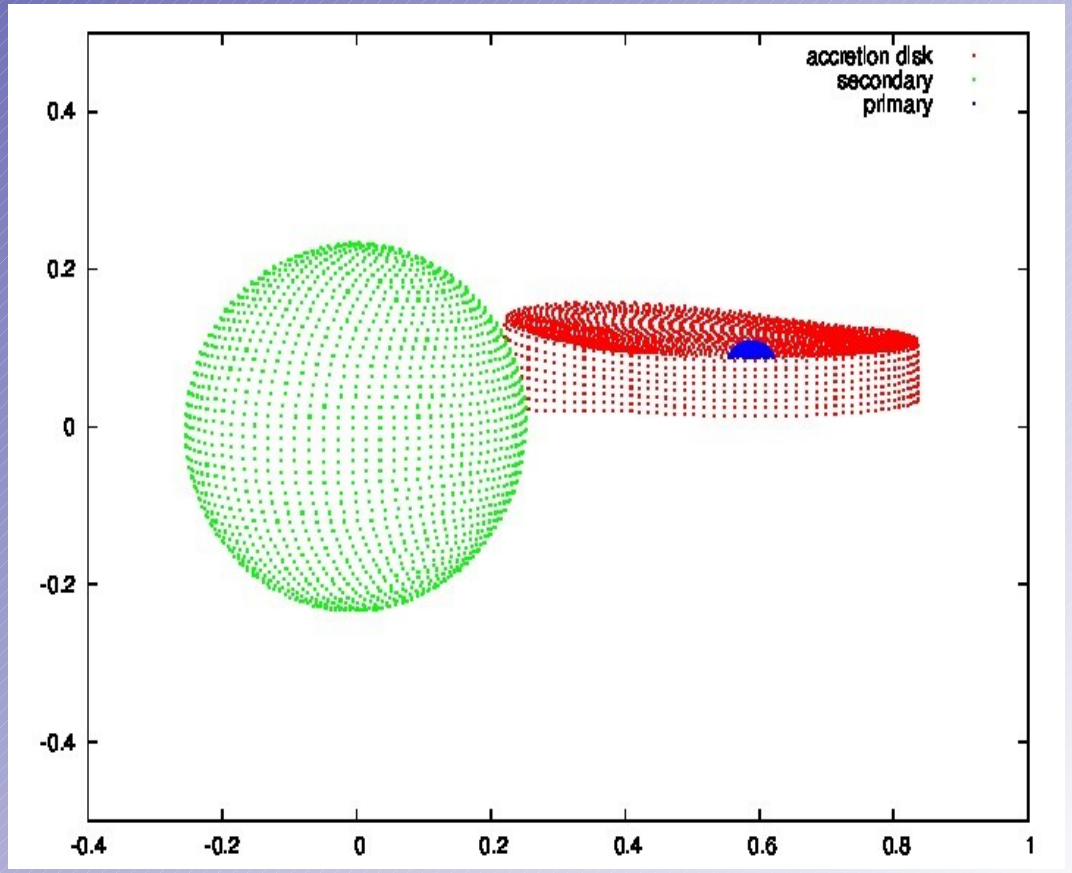
Non-circular disk model

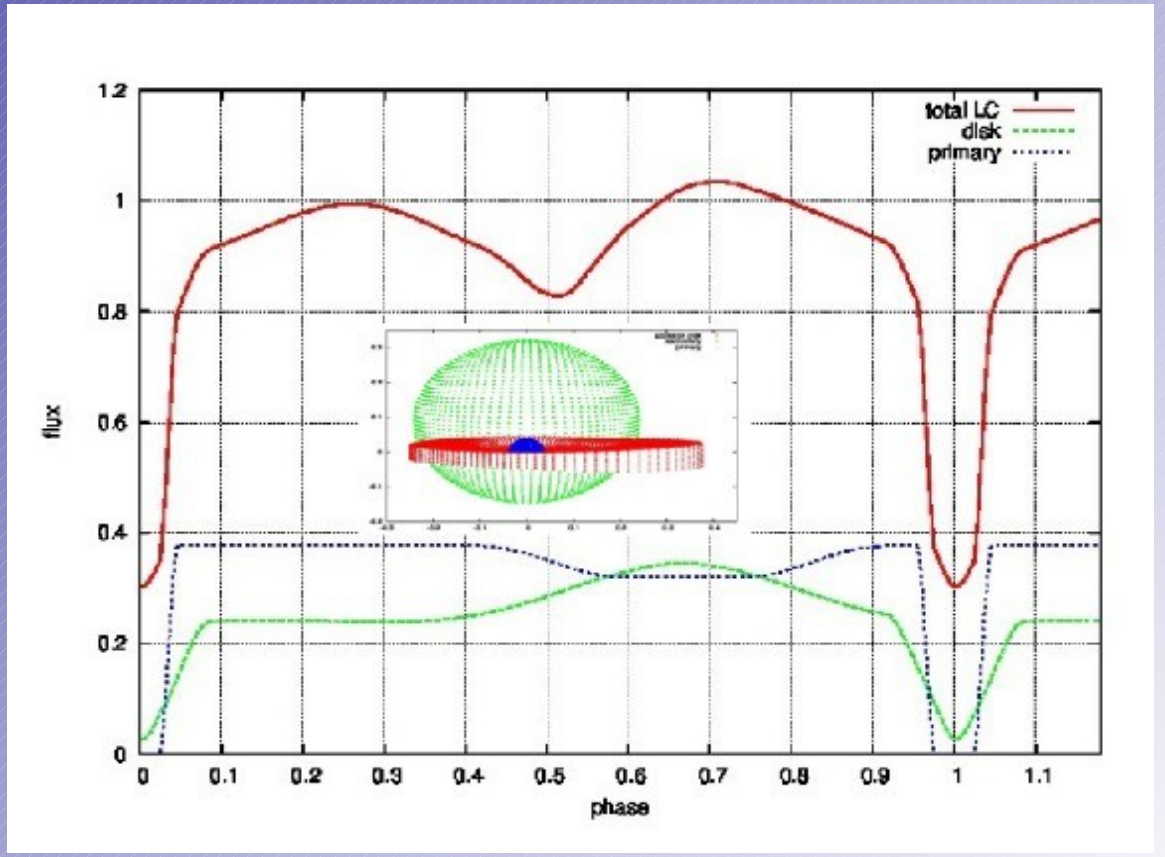
- Model essentially the same as for circular model (Zola 92), just disk shape modified
- Vertical thickness bigger when

  radius larger



Non-circular disk effects

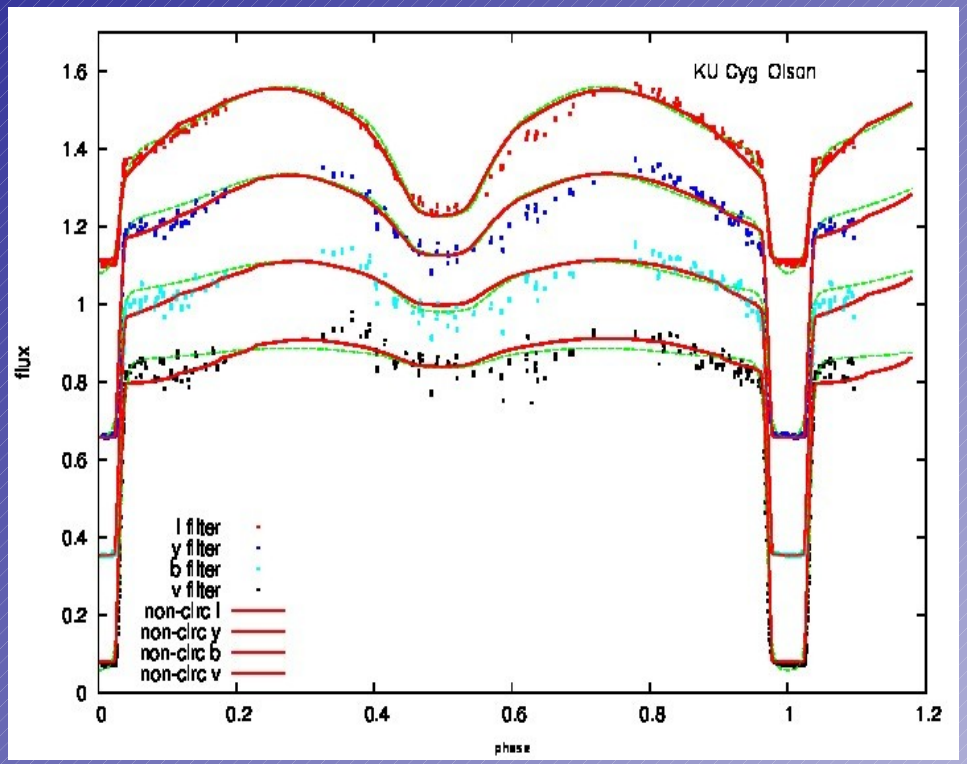
- Additional affects due to non-circular disk geometry:
- Asymmetric minimum/minima
- Heights of maxima can be different

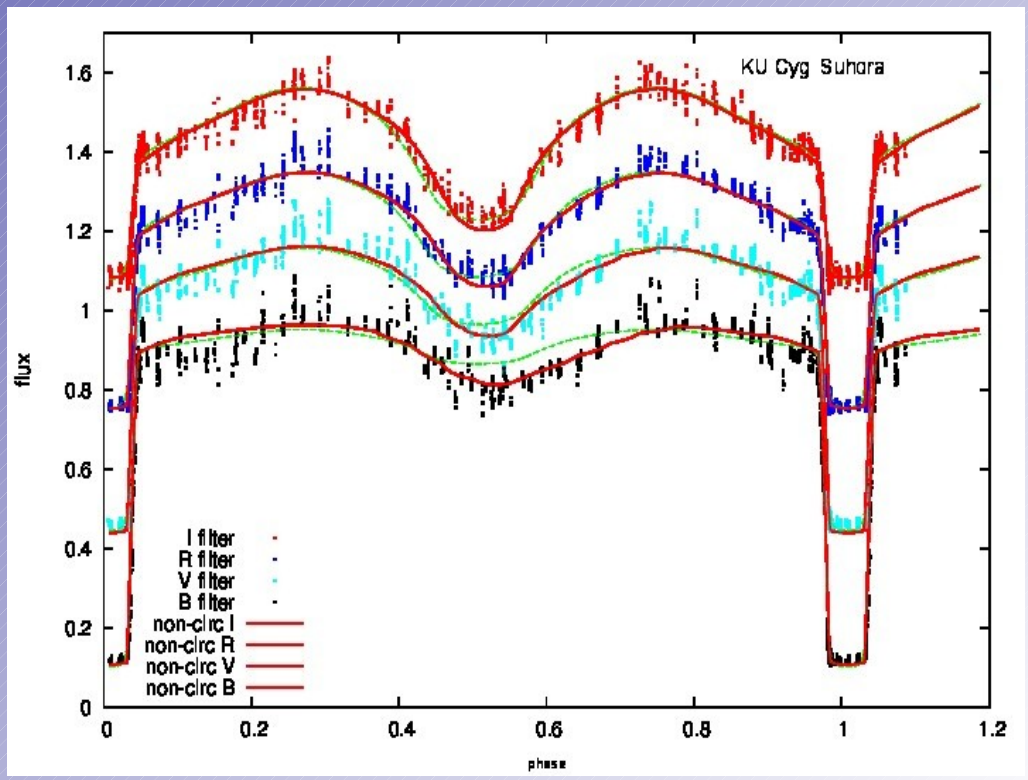


Model application to KU Cyg

A long period Algol-type eclipsing binary
Double peaked Balmer emission lines observed

Searched for the best fit within circular and non-circular models





Conclusions

- Non-circular accretion disk geometry introduces additional effects in the light curve: asymmetry of a minimum and maxima height difference – can be mistakenly taken for spot(s)?
- We confirm Smak & Plavec's (1997) prediction that the disk in KU Cyg occasionally grows and becomes more eccentric in a similar way to what is observed in cataclysmic variables. The timescale of this behaviour is a few years