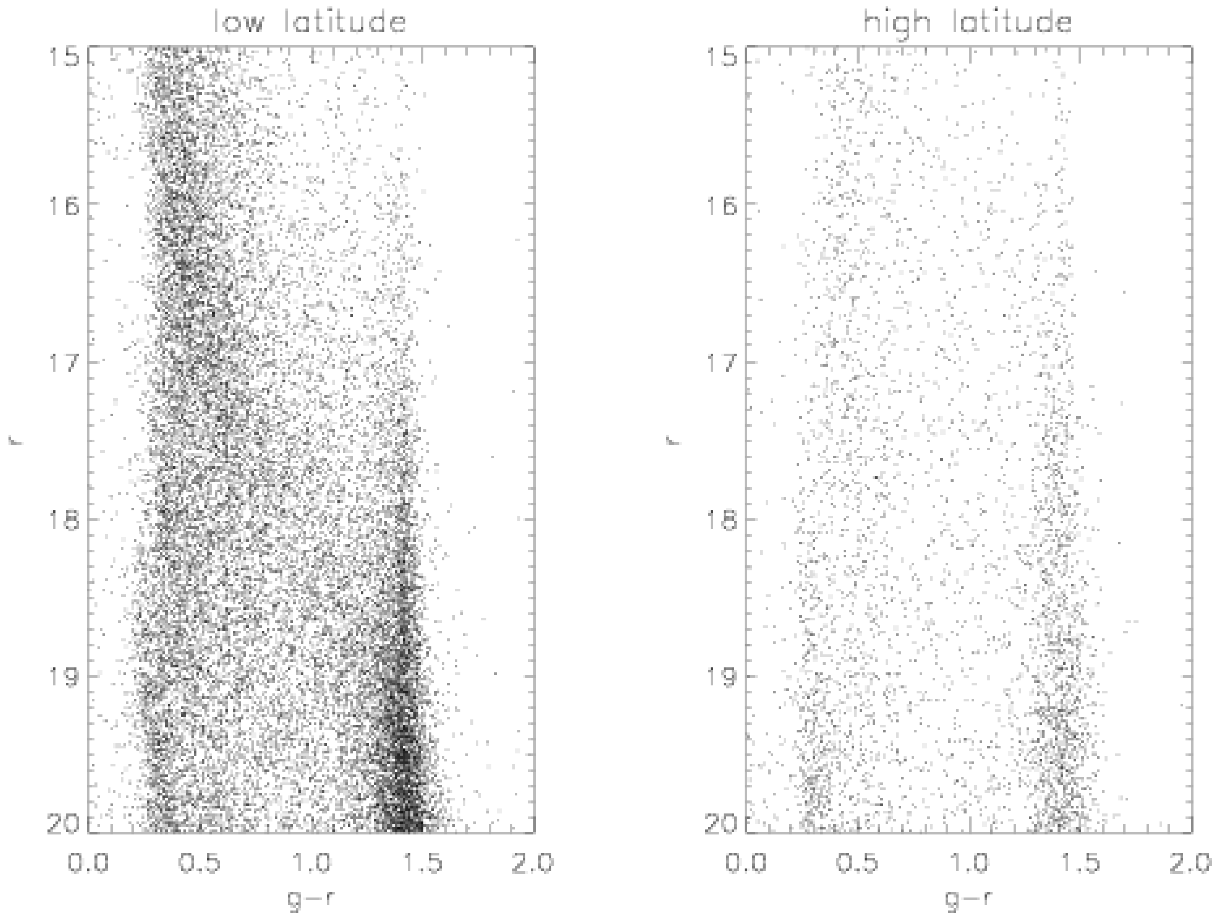
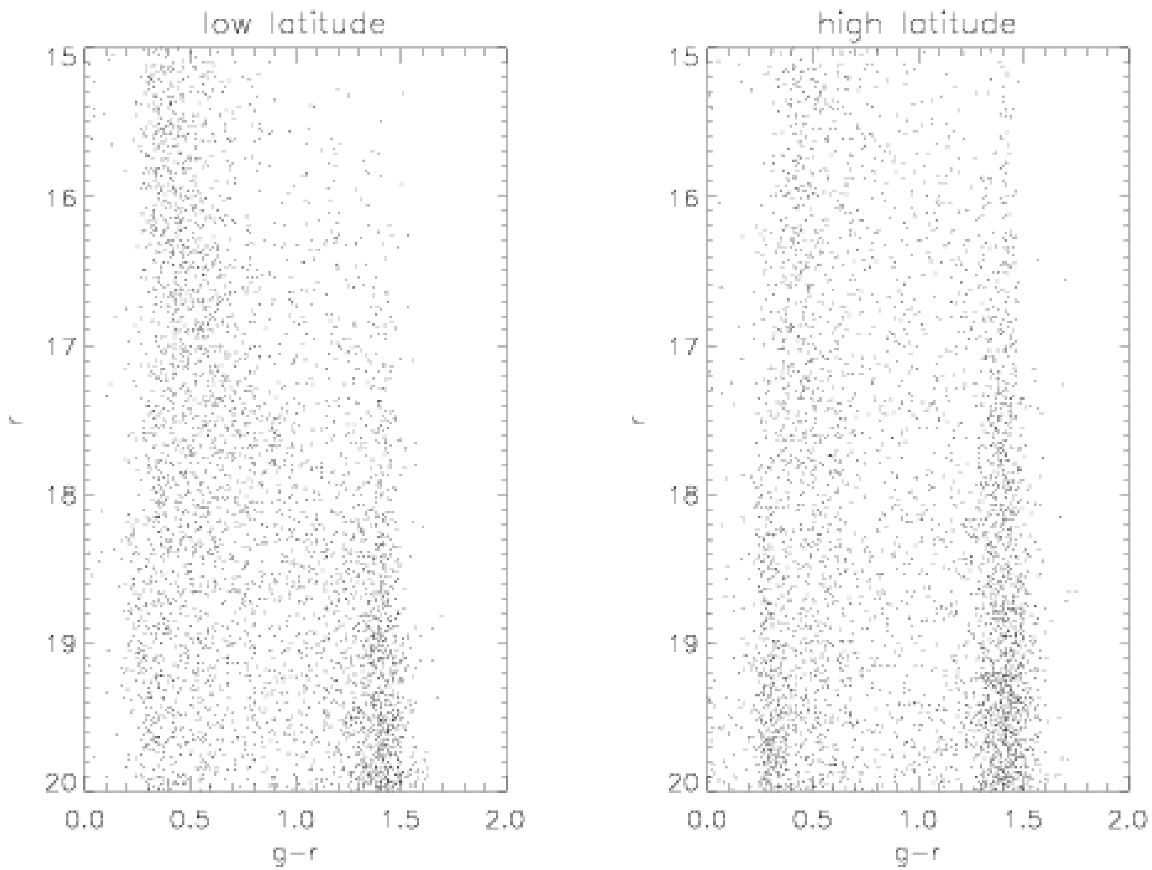
Assignment # 3



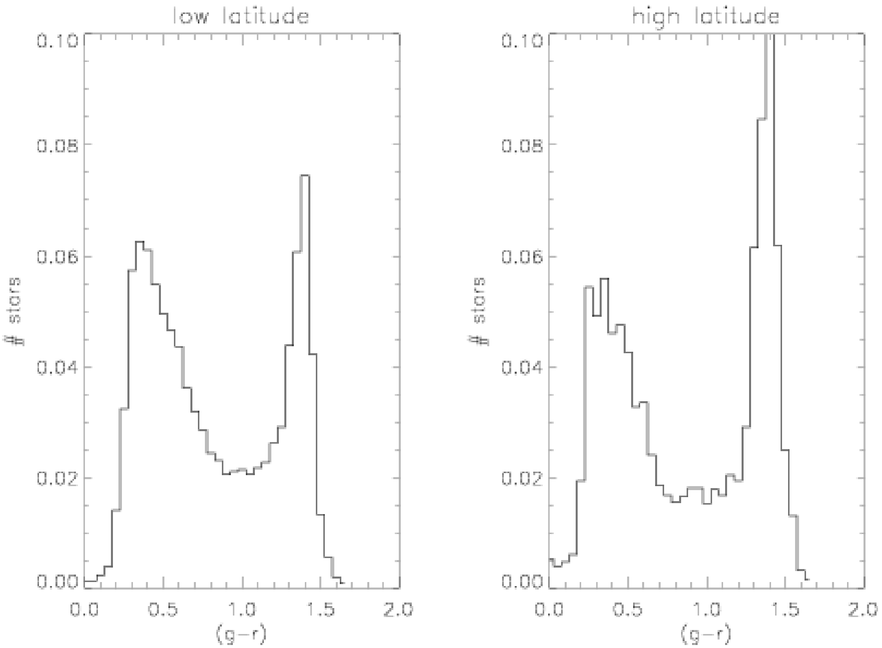
Colour-magnitude diagrams: $N_{low\ b} > N_{high\ b}$

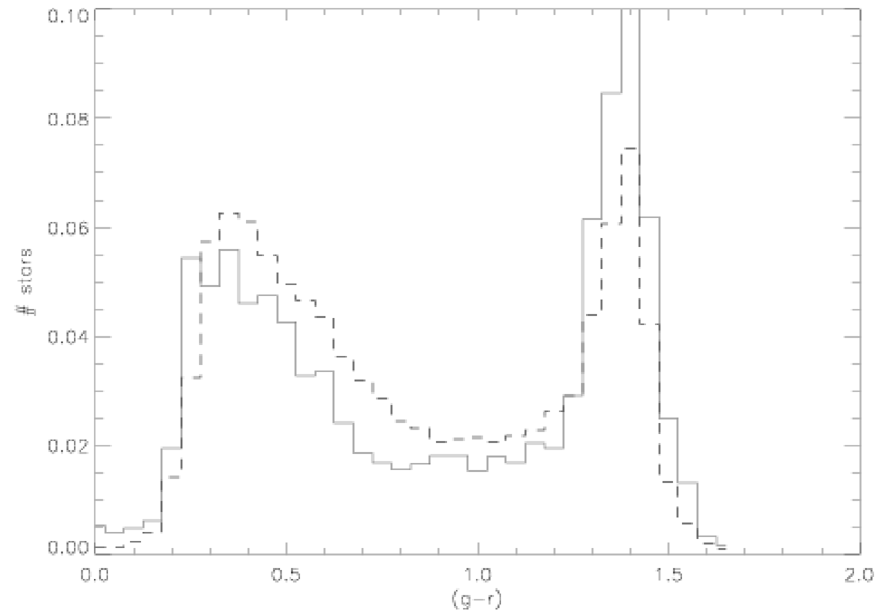
Overdensity of stars at (g-r) ~ 0.3 - 0.5 and at (g-r) ~ 1.4



Same number of stars:

•red stars are more prominent at high b: M disk dwarfs
•very blue stars (g-r) ~ 0.2 more at high b: halo turn-off stars

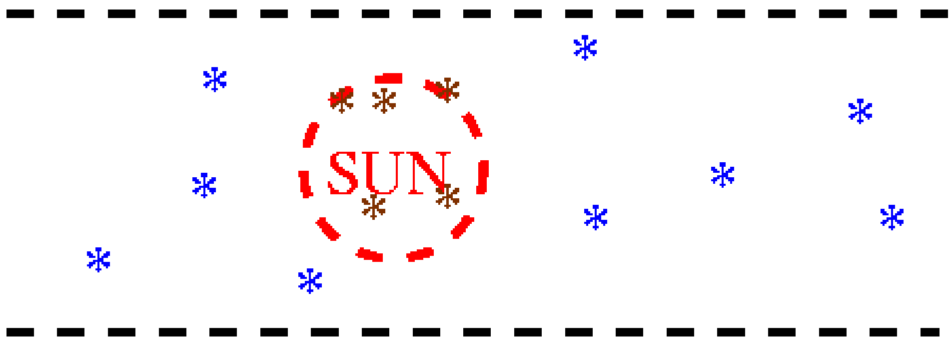




Same number of stars:

- red stars are more prominent at high b: M disk dwarfs
- very blue stars (g-r) ~ 0.2 more at high b: halo turn-off stars

- M stars are in the plane but are very faint intrinsically



- An M dwarf has absolute magnitude $M_V \sim M_G \sim 14$

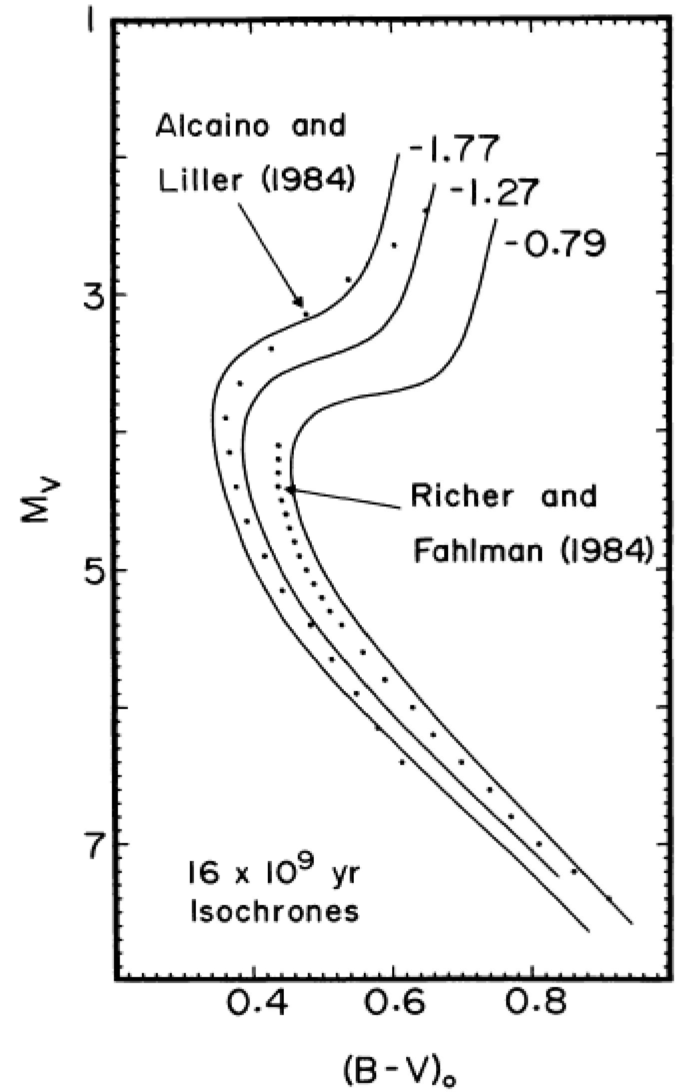
- For a distance D ~ 10 - 100 pc (well within the thin disk):

$$m = M - 5 + 5 \log D = 14 - 5 + 5 \log D = 9 + 5 \log D \sim 14 - 19 \text{ mag}$$

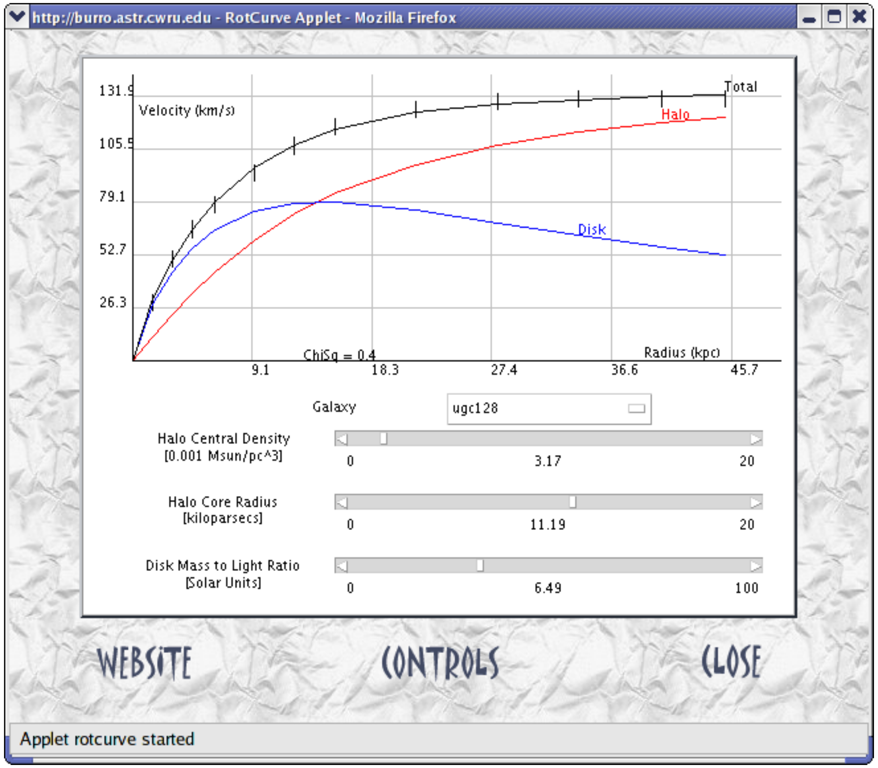
- This explains why there are only seen fainter than a given magnitude

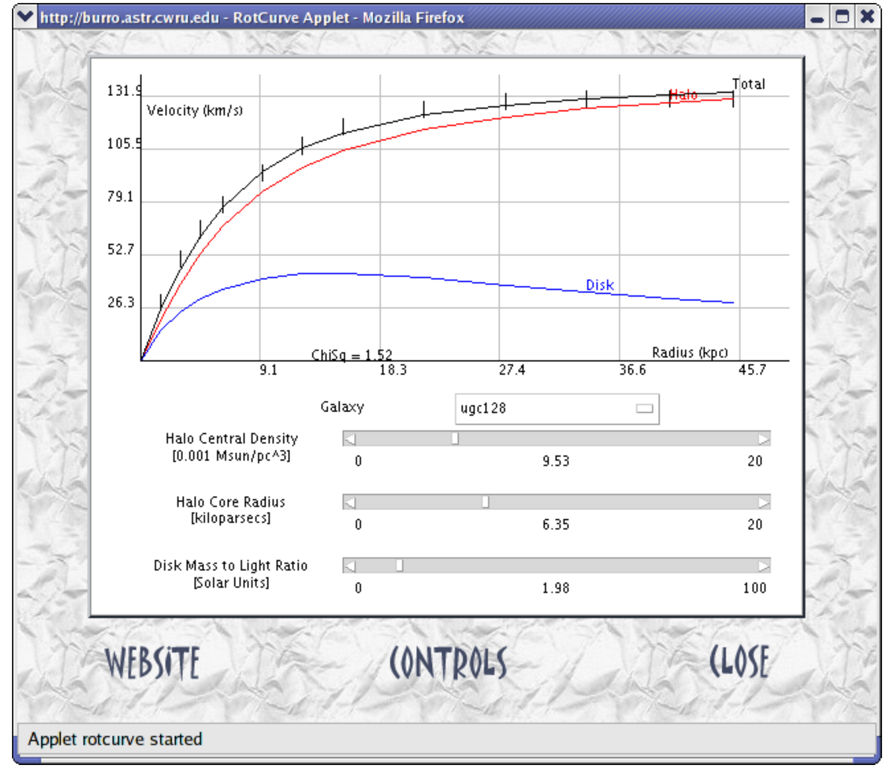
- A G-dwarf (like the Sun) has $M_V \sim M_G \sim 5$, if m ~ 17 mag, then
  log D ~ 1/5 (17 - 5 + 5) ~ 3 -> D ~ 1 kpc (well beyond disk scale-length)

- halo turn-off: very sharp feature at blue end
- most prominent at high latitude because higher fraction of halo stars wrt disk
- bluer than other T.O: because of very low metallicity



Assignment # 5





Many fits are very good: the curve is well within the error bars

Minimum Chi-sq is best fit, but many models are consistent with the data

Uncertainties of the values of the best fit parameters are relatively large