An interpretation of observed truncations in the NIR

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Observation and theory

Observations: CAIN NIR camera on the CST (1.5m)

- Extinction effects minimized.
- old stellar populations.
- Data reduction with REDUCE (R. Peletier)
- Edge-on galaxies deprojected with numerical inversion.
- J, Ks, some H
- 4 + 18 galaxies

Theory: Magnetic model of truncations.

Observations are kept uncontaminated by theoretical prejudidges. Theory is fully contaminated by observational results

The truncation curve

- $$T(R) = \mu(R) - \mu_{\text{inner disk}}(R)$$

$$T(R) = \frac{a}{(R_t - R)^n} \approx \frac{a}{(R_t - R)}$$

$$n = 1.25 \pm 0.4 \quad (16\ \text{curves})$$

$$n = 0.85 \pm 0.3 \quad (40\ \text{curves})$$

The profile

- The $(R_t\text{-}R)^{-1}$ profile is a smooth version of the early sharp cut-off description.
- We cannot discard a two-slope description.
- Some of our profiles could be fitted to a two-slope profile
- Some profiles are anti-truncated (as in Pohlen, Beckman, Pérez...)

- The smooth complete truncation seems to be the simplest fit to our data
- From a theoretical point of view, NIR and optical profiles could be different, as optical profiles are more affected by star formation. (Stars could migrate from the birth place or escape)

Frequencies

- Truncated: 7/18
- Untruncated: 4/18
  - (two of them anti-truncated)

  - Other galaxies are too noisy to obtain firm conclusions about frequencies.
  - “Many” galaxies have truncated stellar disks.

Statistical properties

- Are late tape galaxies more oftenly truncated ?

- R_t (J) > $R_t(K_s)$
- At longer wavelengths the truncation is more important (from 40 points)
- Clear evolutionary phenomenon.
- Clear relation between R_t and $V_{rotation}$(large radii), first notized by Pohlen et al.

- (for a comparison take into account that some authors give the break radius, and others the truncation radius)

$$R_t(J)/h(J) = 3.19 \pm 0.95$$

$$R_t(K_s)/h(K_s) = 3.60 \pm 1.04$$

$$R_t(J)/h(K_s) = 3.63 \pm 1.12$$

$$R_t = (V_{rotation}(\infty))^c$$

$$c = 1.46 \pm 0.18 \approx 3/2$$

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