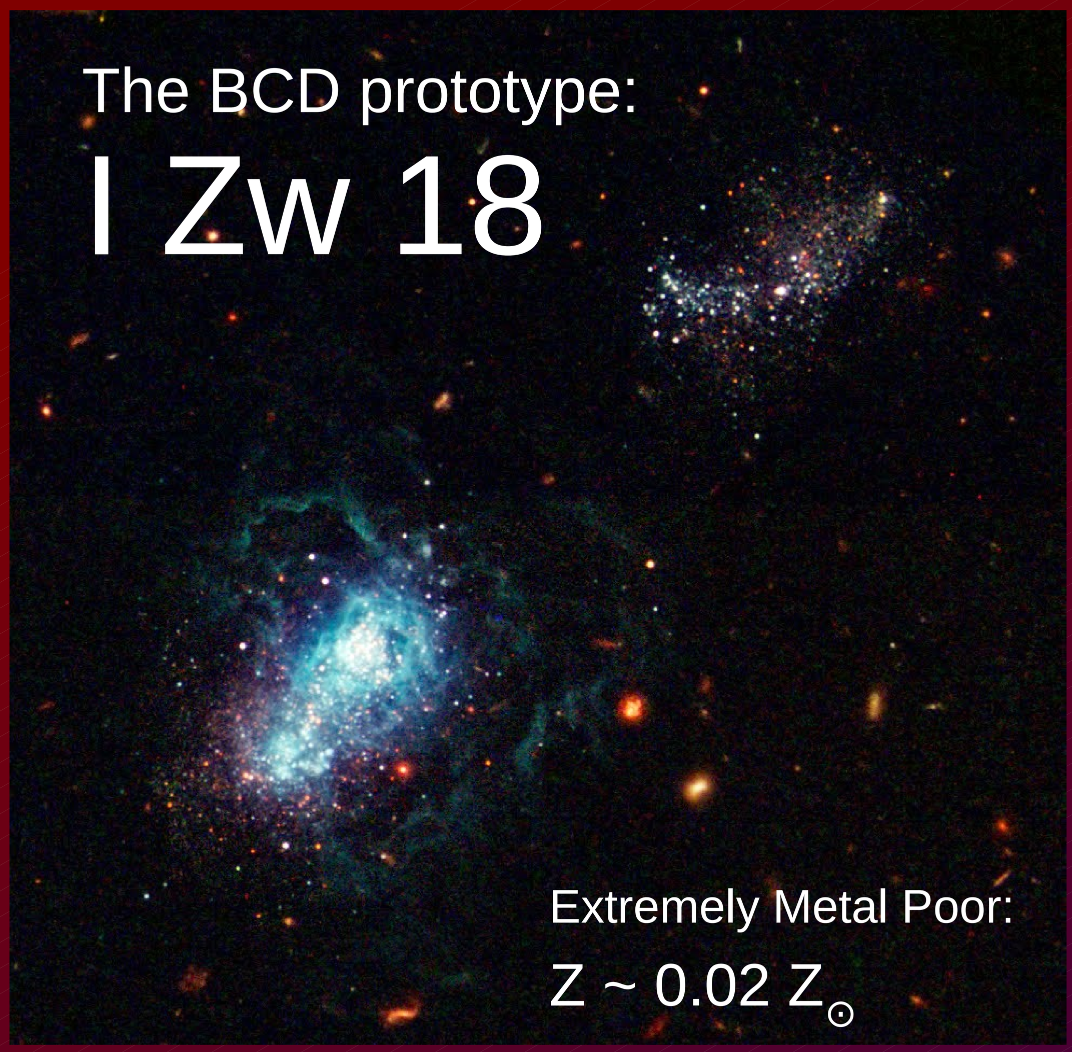


Blue Compact Dwarfs (BCDs) =

starbursting low-mass galaxies in the Local Universe (D < 20 Mpc).

BCDs have low nebular metallicities ($0.2 < Z/Z_\odot < 0.02$), but they are not young galaxies, as they contain old stellar populations with ages > 2-3 Gyr (e.g. Tosi 2009). Also, the starburst is a transitory event.

QUESTIONS:

1) What triggers the starburst?
(external or internal mechanisms?)

2) What are the progenitors/descendants?
(connection with other types of dwarfs?)

Striking HI properties of BCDs:

1) Strong concentration of HI in the starburst region
(how does gas concentrate into the galaxy centre?)

2) Steep central velocity gradient
(Fast rotation? Inflows/outflows? High velocity dispersion?)

Both properties are *not* observed in other gas-rich dwarfs!!

THIS PROJECT: HI study of a sample of 10 nearby BCDs which have been resolved into *single stars* by HST.

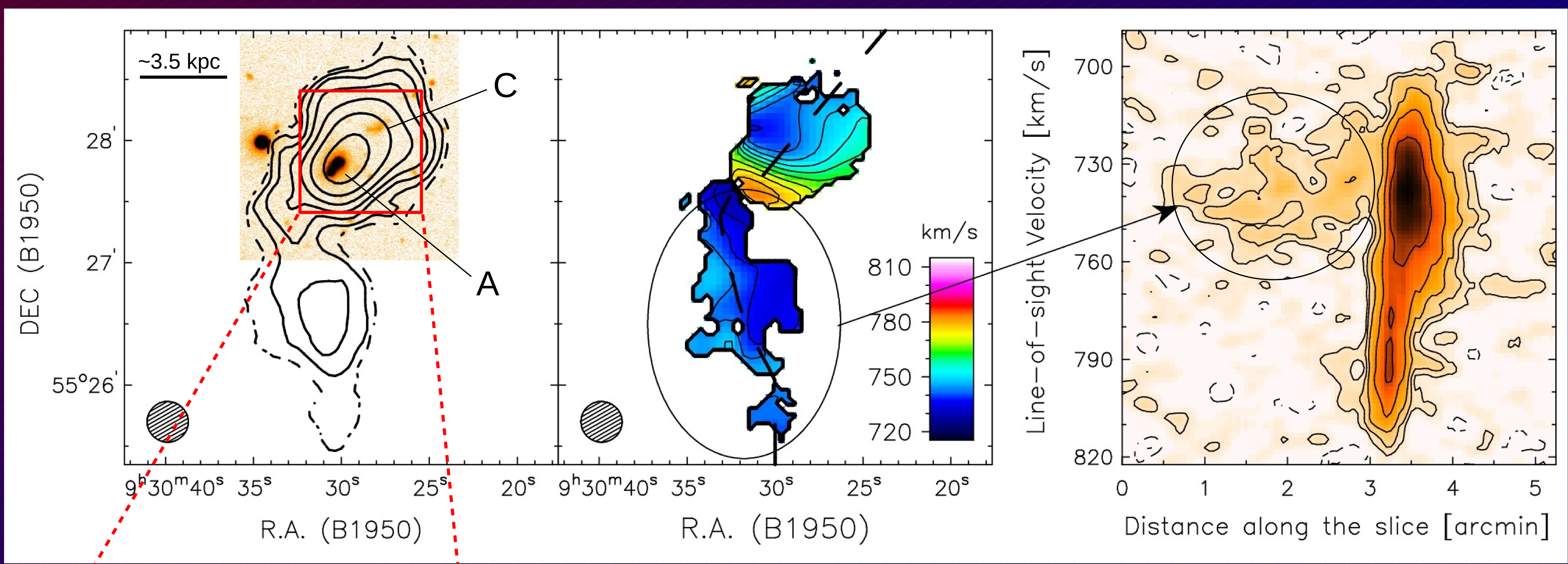
EVLA / WSRT { HI distribution & kinematics (rotation, inflows/outflows); Gravitational Potential (baryons & dark matter)

HST { Distribution of the resolved stellar populations; Star-formation History (*mass* in young & old stars)

We present here our results for I Zw 18, a prototypical BCD.

Dynamics of Starburst Dwarfs

1) Interaction triggering the starburst?



Possible face-on view

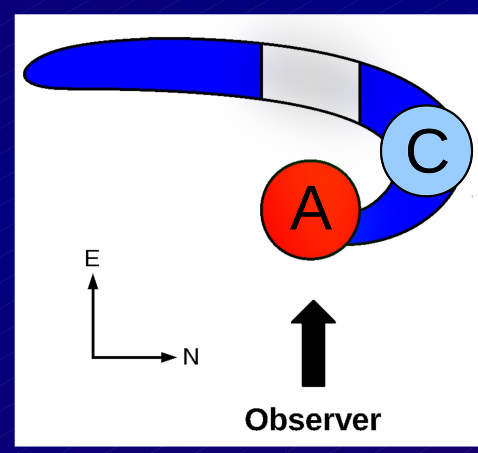


Figure 1. *Left*: HI map at 20" res. overlayed on a B-band image. *Center:* velocity field. *Right:* Position-Velocity (PV) diagram obtained following the southern tail (see dashed line on the velocity field). The tail is not attached to the southern side of I Zw 18, as the gas velocity shows a sharp change of ~70 km s^{-1}. A possible configuration is shown by a cartoon.

2) Compact fast-rotating disk!

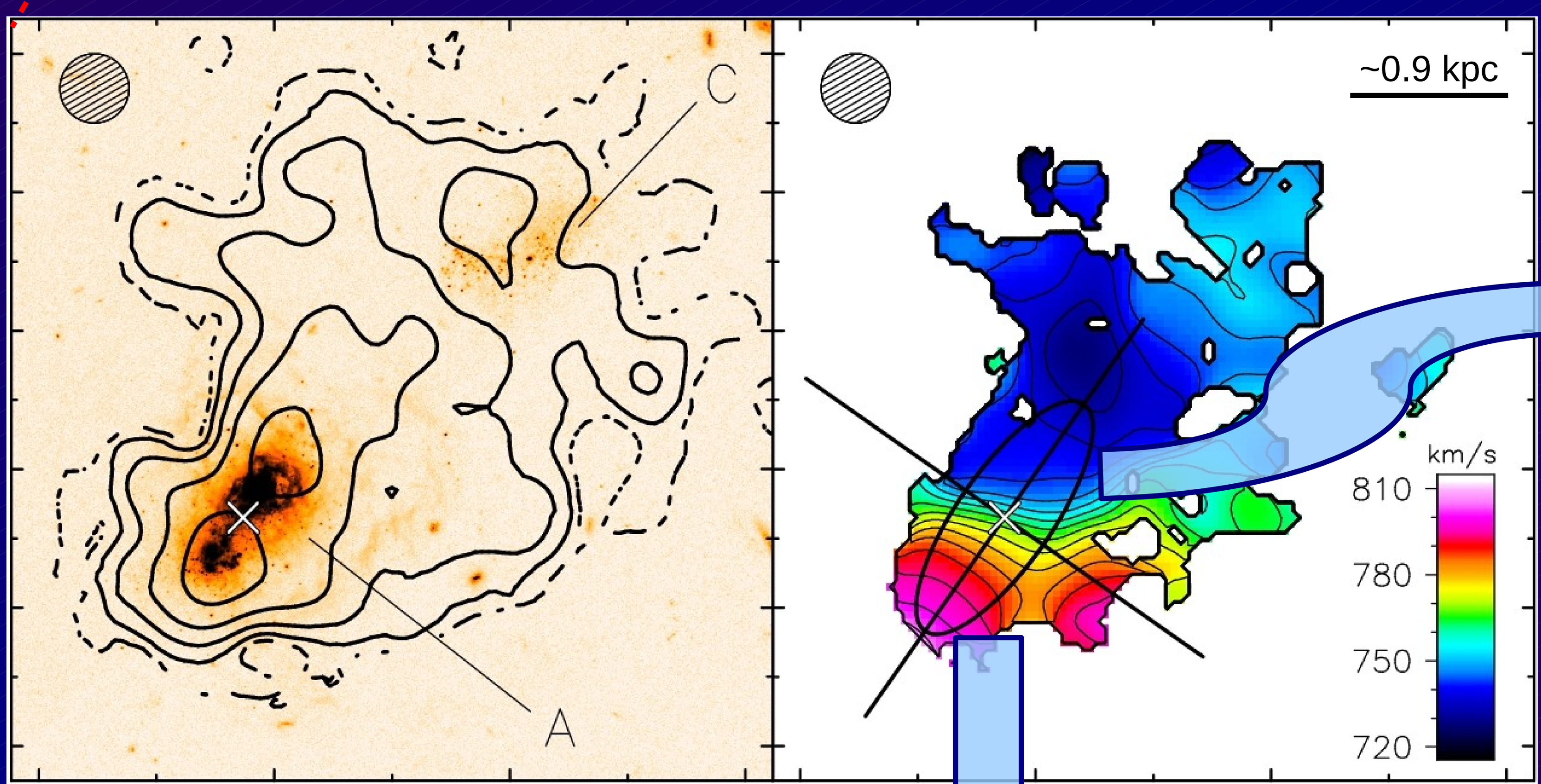


Figure 2. *Left:* HI map at 5" res. overlayed on a V-band HST image. *Right:* velocity field. The ellipse shows the modeled disk.

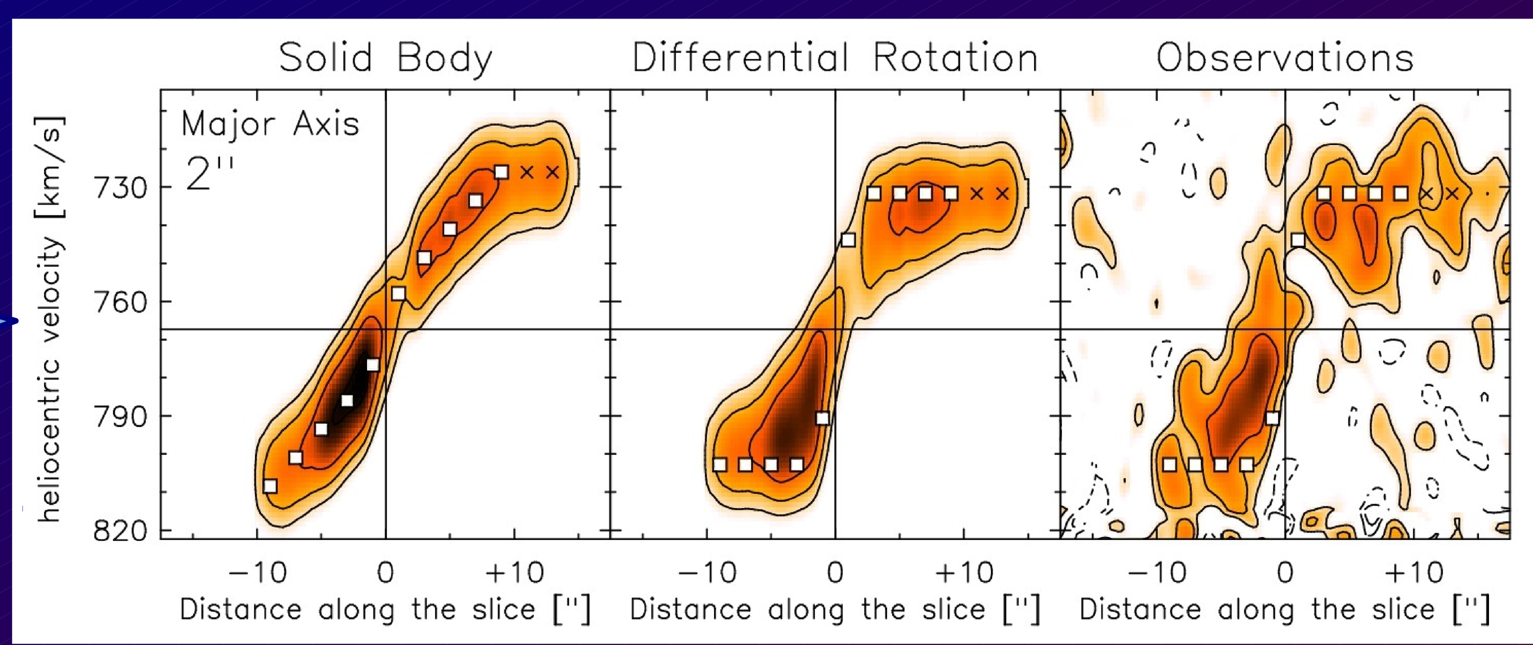


Figure 3. Comparison between the observations (*right*) and two kinematical models of a disk: solid body (*left*) and differential rotation (*center*). Squares show the input rotation curve. The PV-diagrams are at 2" res. and taken along the disk major axis.

A "miniature" HSB disk galaxy

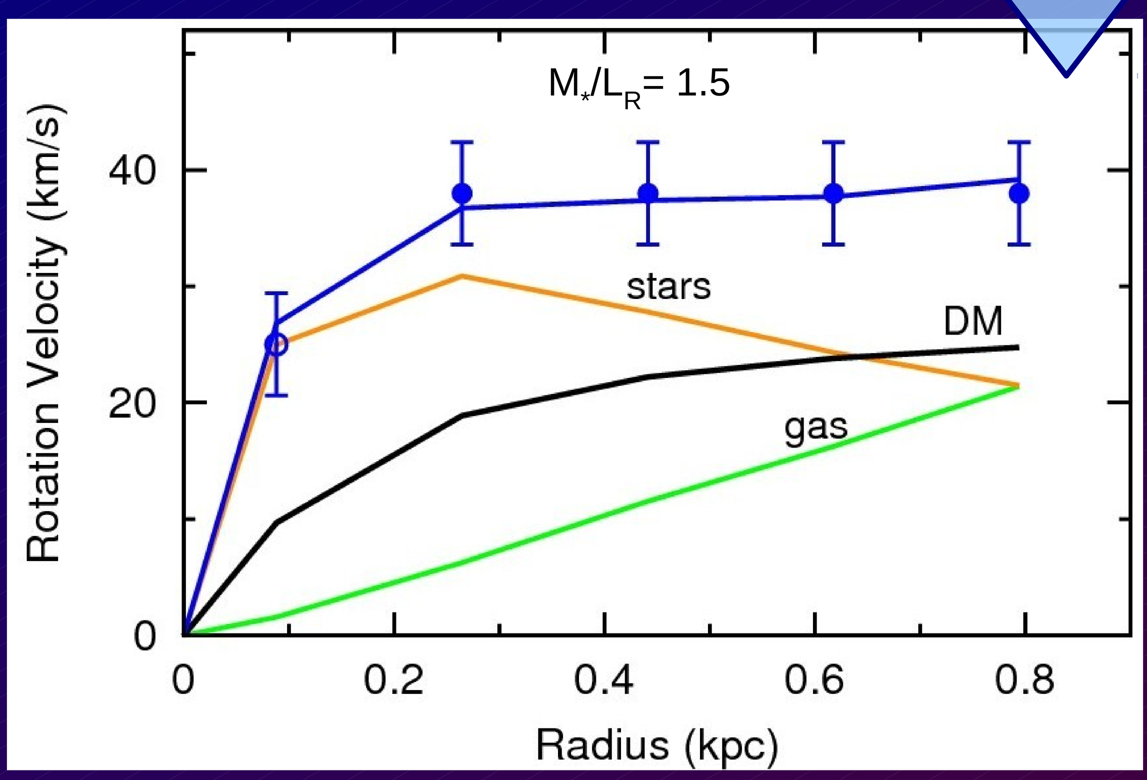


Figure 4. "Maximum disk" decomposition of the rotation curve. A M_*/L_R~1.5 implies a stellar mass of ~9 x 10^7 $M_\odot$.

CONCLUSIONS:

1) The starburst is likely triggered by a tidal interaction.

2) I Zw 18 is structurally different from typical dIrrs:

- Strong concentration of HI with N_{HI} ~1-2 x 10^{22} cm^{-2};
- Compact distribution of stars (see also Papaderos et al. 2002);
- Steeply rising & flat rotation curve, indicating a strong central concentration of mass (luminous or dark).

The descendant of I Zw 18 cannot be a typical LSB dwarf: a link between the starburst & the gravitational potential?

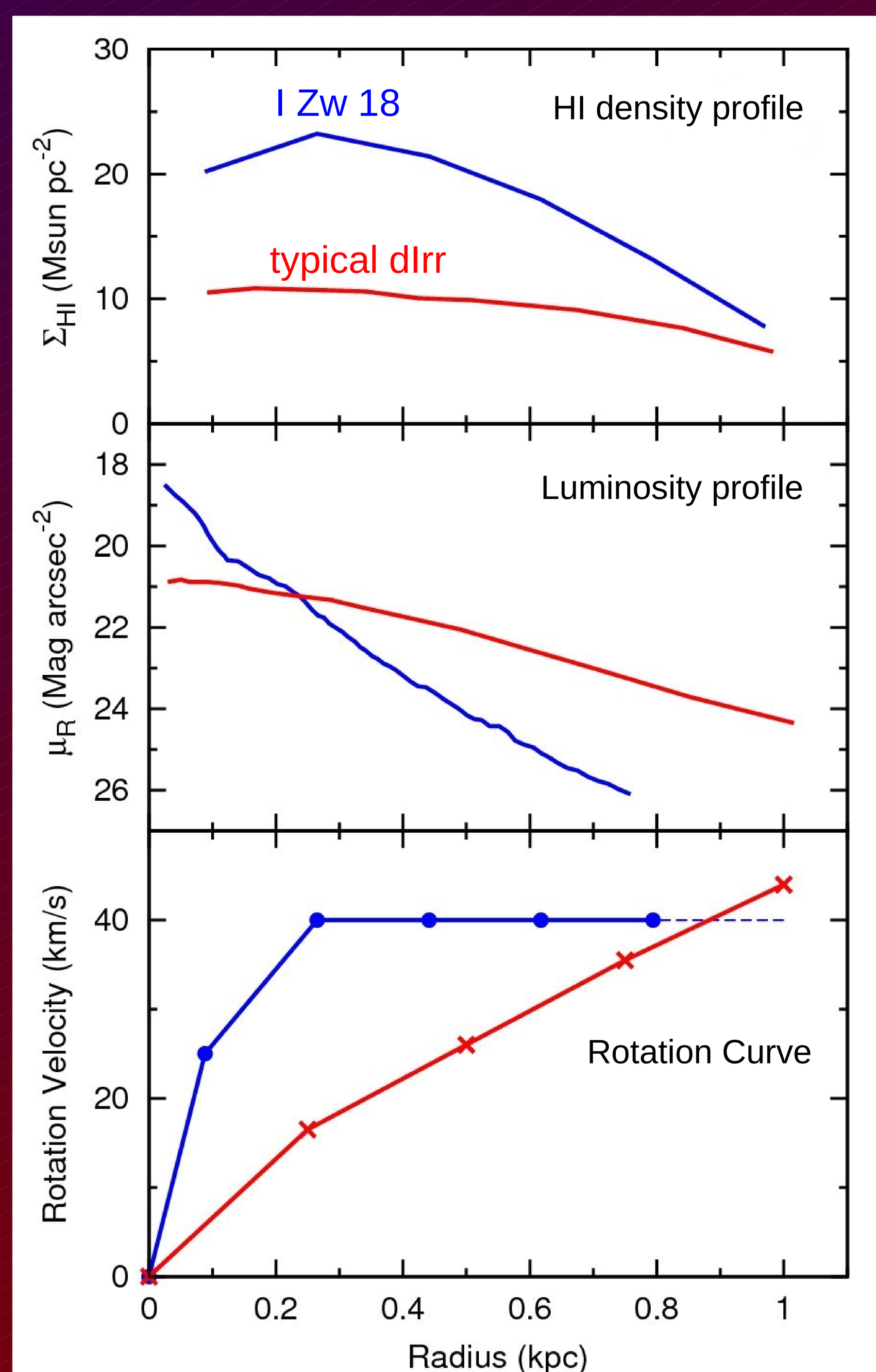


Figure 5. Comparison between I Zw 18 (blue) and the typical dIrr UGC 7232 (red), taken from the sample of Swaters (1999). *Top:* HI surface density profile. *Middle:* R-band surface brightness profile. *Bottom:* HI rotation curve.

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