GHOSTS
Quantifying the Faint Outskirts of M101 using Resolved Stars

µ_g = 30 mag/"^2
70 kpc

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g-band, Dragonfly array
CMDs of resolved stars

North-East side

F9 (46 kpc) - F8 (35 kpc)

WFC3 - ACS

F814W

F606W - F814W

F814W

East side

F4 (73 kpc) - F3 (61 kpc) - F2 (46 kpc) - F1 (34 kpc)

WFC3 - ACS

F606W - F814W

West side

F5 (19 kpc) - F6 (43 kpc) - F7 (55 kpc)

ACS - WFC3 - ACS

F606W - F814W

Empty fields (e.g. HDF)

Empty-AF1 - Empty-AF2

F606W - F814W
Radial profiles

Resolved RGB stars (HST)

Integrated light (Dragonfly)
Modeling the M101 Halo

✓ Two component fits:
  - An exponential disk.
  - A power law halo ($\alpha = -3$).

✓ The Entire region & the West side:
  : Slight excess at the outer region.

✓ Resolved stars + Integrated light

\[
\frac{M_{\text{halo}}}{M_{\text{gal}}} = \sim 0.5 \% \\
(\alpha = -2\sim -4)
\]

✓ Integrated light only (Merritt+16)

\[
\frac{M_{\text{halo,} > 5R_h}}{M_{\text{gal}}} = 0.04 \pm 0.08\%
\]
We compare the halo properties of M101 with those of the six GHOSTS survey galaxies as well as the Milky Way and M31 and find that M101 has an anemic stellar halo similar to the Milky Way.

Comparison with observed halos and models

The M101 halo marks the low mass & metallicity end of the observed halos, but agrees with the model predictions.

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