

Photometry and astrometry with JWST – I. NIRCcam
Point Spread Functions and the first JWST
colour-magnitude diagrams of a globular cluster
D. Nardiello et. al., (September 2022)

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Multiple Populations in Globular Clusters

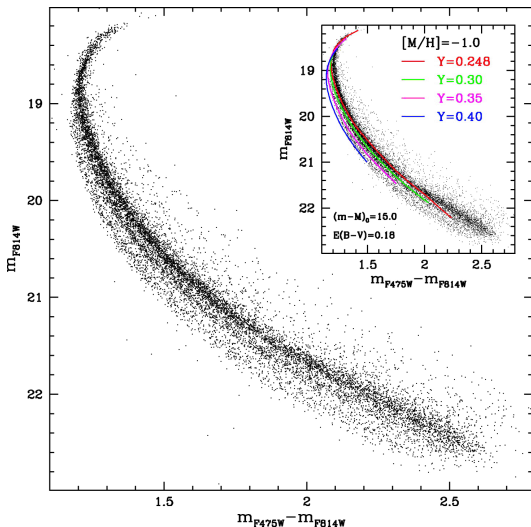


Figure: Figure from Piotto et al. (2007) showing multiple identified populations in the cluster NGC 2808

Multiple Populations in M92

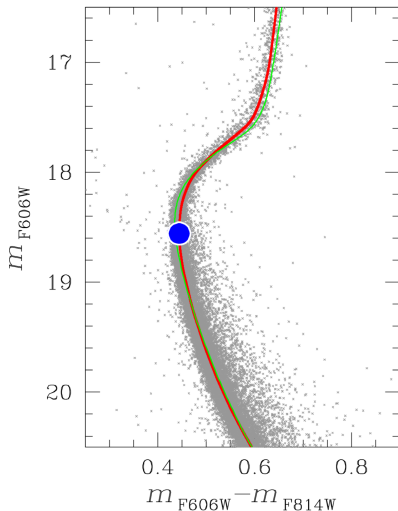


Figure: CMD from Hubble of M92, red line is the fiducial line, green line is a BASTI-IAC 13Gyr Isochrone

Multiple Populations in M92

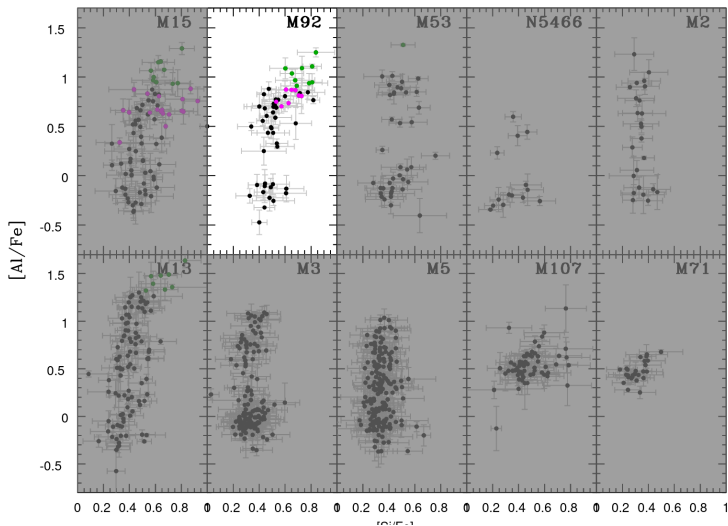
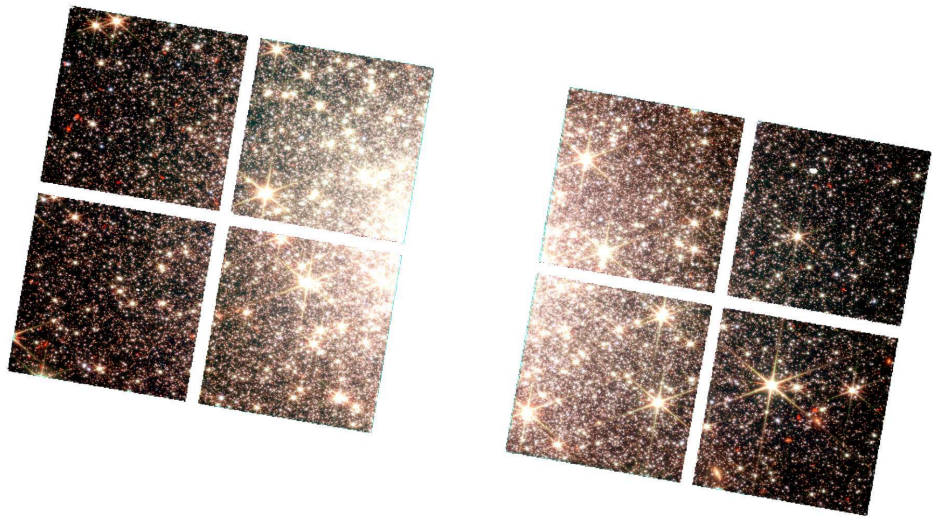


Figure: Aluminum as a function of silicon abundance for RGB stars in M92 (Masseron et al., (2018))

JWST Imagery



PSF Modeling

- Optics
- Sensor
- Time

PSF Modeling

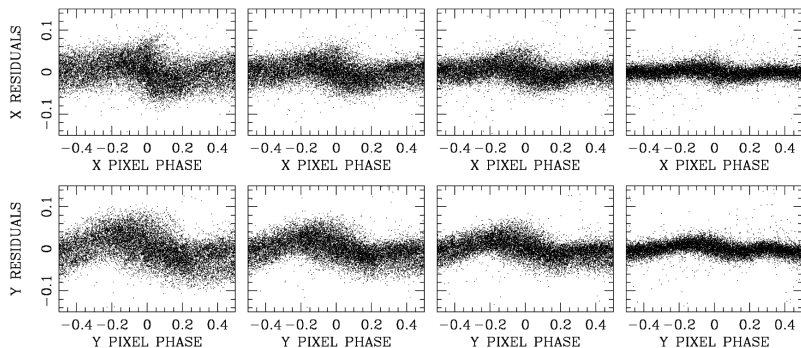


Figure: Evolution of residuals in PSF center vs star position as iterative PSF modeling takes place. A total of 10 iterations were used globally before the global model was used to as an initial guess for regions sub sampled around the detector. Then also time...

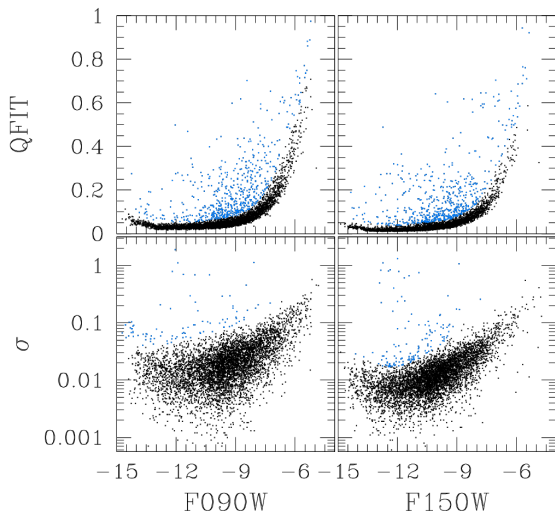


Figure: Example of the bad source rejection technique adopted by the authors.

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M92

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- Moreover, there are significant offsets from HST photometry
- JWST pipeline Zero-Point offsets still need to be refined

M92 –registered with HST

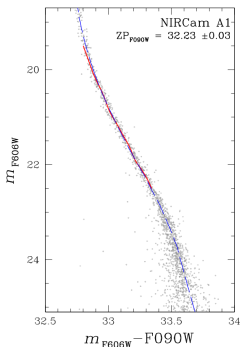


Figure: CMD Using both HST and JWST filters used to derive new photometric zero-points

- Cross matched data between the JWST catalog and the HST catalog is used to derive new photometric zero-points.

M92 – CMDs

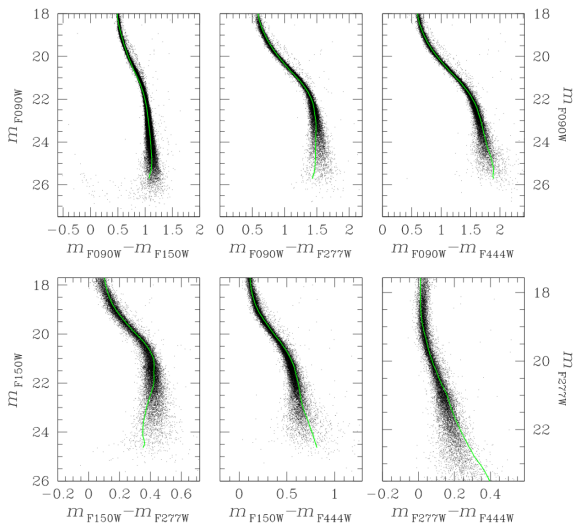


Figure: CMDs produced with JWST data for M92. The highest S/N CMD (F090W, F090W-F150W) reaches to $\sim 0.1M_{\odot}$.

M92 – White Dwarfs

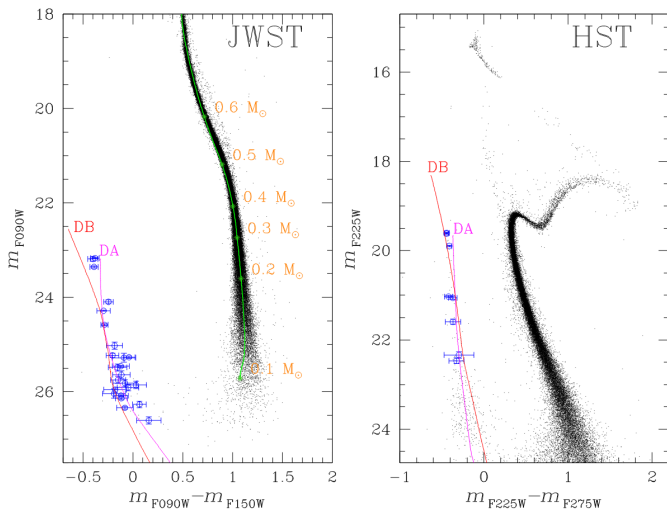


Figure: CMDs for M92 from HST and JWST showing White Dwarf sequences in both.

M92 – Multiple Populations

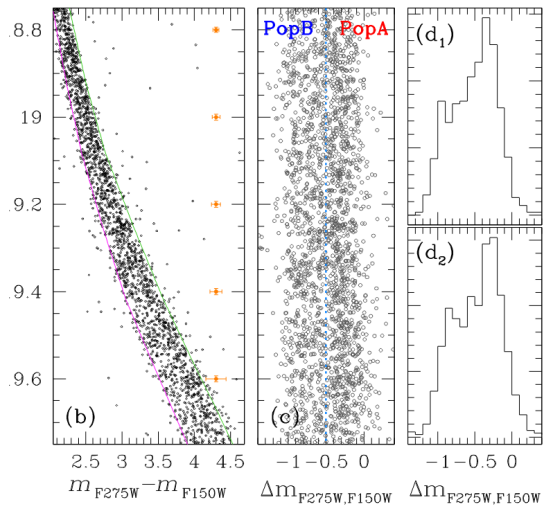


Figure: Verticalized CMD showing 2 potential populations in cross matched HST/JWST data

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