

An internal view of stellar system Terzan 5

F. Mauro¹, V. Gotta¹, C. Moni Bidin¹, D. Geisler^{2,3,4} and F. Ferraro⁵

¹Instituto de Astronomía, Universidad Católica del Norte, Chile.

²Departamento de Astronomía, Casilla 160-C, Universidad de Concepción, Concepción, Chile.

³Instituto Multidisciplinario de Investigación y Postgrado, Universidad de La Serena, Raúl Bitrán 1305, La Serena, Chile.

⁴Departamento de Astronomía, Facultad de Ciencias, Universidad de La Serena, Av. Juan Cisternas 1200, La Serena, Chile.

⁵Dipartimento di Fisica e Astronomia “Augusto Righi”, Università degli Studi di Bologna, Via Gobetti 93/2, 40129 Bologna, Italy.

Keywords: Galaxy: bulge, globular clusters: individual, open clusters and associations: general, stars: mass-loss, stars: pre-main-sequence

Corresponding author: francesco.mauro@ucn.cl

We present the spacial-photometric analysis up to 2 arcmin of the globular cluster Terzan 5 using observed with GeMS/GSAOI and HST. Terzan 5 is one of the most interesting stellar systems of the Galactic Bulge. It is one of the most massive globular clusters of the Milky Way, and is really rich in pulsars, besides it is localized near the center of the Galactic bulge. Ferraro et al. (2009) discovered a double horizontal branch (HB), due to two stellar populations that show a substantial difference in age and metallicity (7Ga and 0.5 dex, respectively). Consequently, Terzan 5 together with Liller1, is thought to be one of the few remaining building blocks of the Galactic Bulge. In this work, we determine the spatial distributions of this stellar system.

We used the photometric pipeline SkZpipe (Mauro, 2020) to process GeMS/GSAOI and VVV (Minniti et al., 2010; Saito et al., 2012) data, producing a photometric catalog covering from the center up to the tidal radius. In this work, we show the analysis of the HB populations up to 2 arcmin from the center.

Figure 1 shows how the population associated with the brighter-redder-younger HB is more concentrated near the center than the population associated with the fainter-bluer-older one.

Figure 2 shows the comparison between the cumulative distributions of the two HBs. It confirms that the younger population is centrally more concentrated than the older one, as the multipopulation theory predicts.

References

- Ferraro, F. R., Dalessandro, E., Mucciarelli, A., et al. 2009, Nature, 462, 483, doi: [10.1038/nature08581](https://doi.org/10.1038/nature08581)
 Mauro, F. 2020, in Boletín de la Asociación Argentina de Astronomía, Vol. 61C (La Plata, Argentina: Asociación Argentina de Astronomía), 59–59

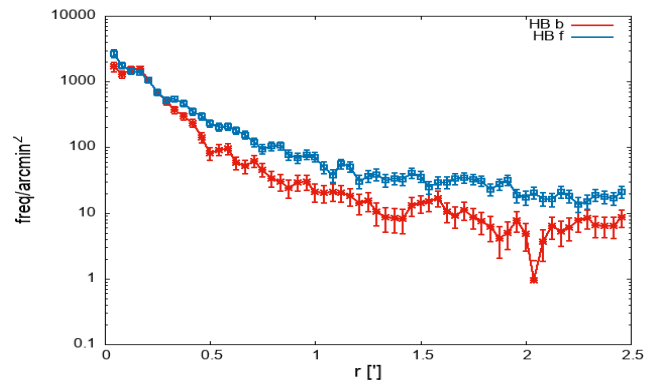


Figure 1. Radial frequency distributions of the redder-brighter and of the bluer-fainter horizontal branches.

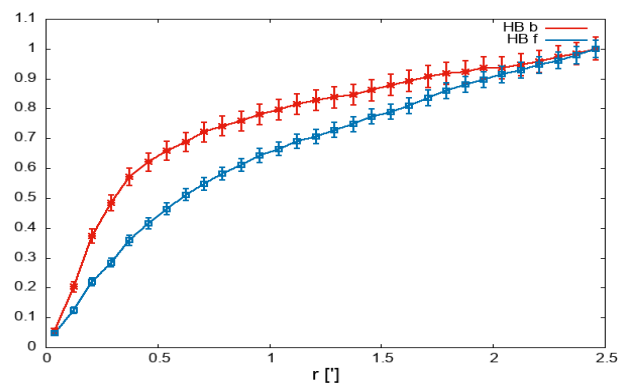


Figure 2. Cumulative distributions of the redder-brighter and of the bluer-fainter horizontal branches.

- Minniti, D., Lucas, P. W., Emerson, J. P., et al. 2010, NewA, 15, 433, doi: [10.1016/j.newast.2009.12.002](https://doi.org/10.1016/j.newast.2009.12.002)
 Saito, R. K., Hempel, M., Minniti, D., et al. 2012, A&A, 537, A107, doi: [10.1051/0004-6361/201118407](https://doi.org/10.1051/0004-6361/201118407)