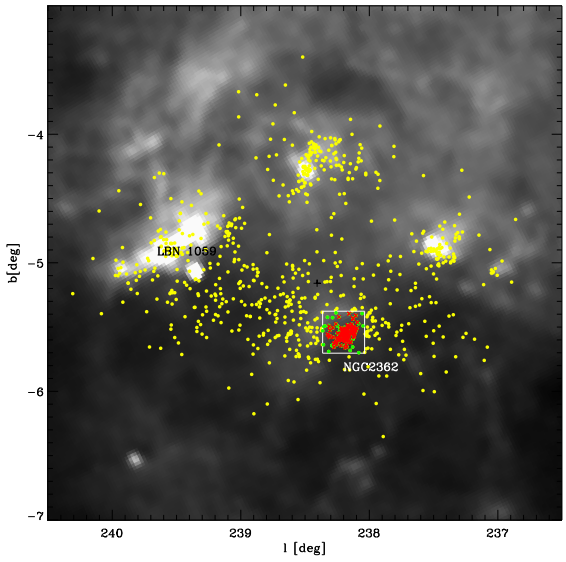

Fig. C.6. Spatial distribution in Galactic coordinates of YSOs associated with NGC2362 (yellow symbols). YSOs falling in the box of 16.9″×16.9″ equal to the Chandra-ACIS field (white box) used in Damiani et al. (2006) are indicated as green symbols. YSOs in common with Damiani et al. (2006) X-ray detections are indicated as red symbols. Objects are overplotted on an IRIS 100 μm image.

around the known cluster centre. The parallax values indicate that all the detected YSOs are located at consistent distances.

We note that to reduce the observed spread in the M_G versus $G - G_{RP}$ diagram shown in Fig. C.7, in the computation of M_G, we used the median cluster distance, rather than the individual member distances. The residual observed luminosity spread in the M_G versus $G - G_{RP}$ diagram is likely due to reddening effects not corrected here and that, on the contrary, are very small in the V versus V-I diagram, where the reddening vector is almost parallel to the cluster sequence in the low-mass range (see Fig. 4 in Damiani et al. 2006).

C.4. Comparison with literature all-sky star cluster catalogues

Using the *gaiaedr3.dr2_neighbourhood* table in the Gaia archive, we retrieved the *Gaia* DR2 identification number of the candidate YSOs selected in our work and thus, using these IDs, we performed the match with the Kerr et al. (2021) list, including 30 518 YSOs within 333 pc and selected with *Gaia* DR2. We found a total of 9 351 objects in common. Among these, 4 676 are associated with clusters with $t \lesssim 10$ Myr and 3 914 are associated with clusters with 10 Myr$\lesssim t \lesssim 100$ Myr in our catalogue.

Using the same procedure as for the Kounkel & Covey (2019) and Kounkel et al. (2020) catalogues, which include 288 370 entries up to 1 Kpc and 987 376 entries up to 3 Kpc, respectively, we find a total of 38 567 and 42 350 YSOs in common. 23 071 (9 494) from the Kounkel & Covey (2019) list and 25 511 (9 559) from the Kounkel et al. (2020) list are associated with SFRs with $t \lesssim 10$ Myr (young clusters with 10 Myr$\lesssim t \lesssim 100$ Myr). The remaining common stars have been discarded by us since they do not belong to the young age range. We note that, while in the contest of the entire all-sky catalogue the fraction of objects in common is very low (∼13% and ∼4%), in the region of the Orion complex it is 67% and 75% (see Sect. C.2). However, we note that our catalogue does not include the string-like massive clusters at $\gtrsim 1$ kpc with spatial distribution aligned to the GP that we discarded in the cluster-validation phase (see Sect. 4.2). Instead, the Kounkel & Covey (2019) and Kounkel et al. (2020) lists include many of these objects and this could explain the low fraction of objects in common with respect to the entire catalogue. In addition, the restrictions to the initial data set are very different. For example, we imposed a photometric selection in the extinction-uncorrected M_G versus $G - G_{RP}$ CAMD, mainly aimed at selecting objects with ages < 10 Myr. On the contrary, in the Kounkel & Covey (2019) and Kounkel et al. (2020) catalogues, no photometric selection has been applied, and, in fact, these catalogues include up to ∼ 1 -Gyr-old clusters.

We also compared our results with the list of 2 017 clusters recently published by Cantat-Gaudin & Anders (2020) that includes 234 128 cluster members. They used the most complete list of clusters from the literature and assigned them cluster membership using the UPMASK procedure (Krone-Martins & Moitinho 2014), which is based on the compactness of the groups in the positional space and is constrained to a fixed field of view. Reliable parameters have been derived for 1 867 of these clusters.

We find that 12 438 members presented by Cantat-Gaudin & Anders (2020) are in common with our catalogue. Those associated with SFRs ($t \lesssim 10$ Myr) and young (10 Myr$\lesssim t \lesssim 100$ Myr) and old ($t \gtrsim 100$ Myr) clusters are 6 788, 2 519, and 2 109, respectively, corresponding to 66, 38, and 76 clusters in our catalogue, in the same age ranges. They belong to 311 clusters of the Cantat-Gaudin & Anders (2020) list[14] with parallaxes > 0.617 mas, which approximatively corresponds to the maximum distance of YSOs identified in our work. In the Cantat-Gaudin & Anders (2020) catalogue, there is a total of 49 074 cluster members with $\pi > 0.617$, $G > 7.5$, and $M_G > 5.0$, and therefore we find that only ∼ 25% of YSOs detected by us are in common with Cantat-Gaudin & Anders (2020). Using the ages derived in Cantat-Gaudin & Anders (2020), we find that 226 of the matched clusters are older than 10 Myr.

For the 331 clusters in common, we compared the distances assigned by Cantat-Gaudin & Anders (2020) computed as the inverted parallaxes of the value given for each cluster and the mean distance obtained by us, which was computed from the weighted mean parallaxes. Errors on the parallaxes were computed as the error on the mean. The comparison is shown in Fig. C.8, where the mean and standard deviation of the residuals between the two measurement sets are also given. The two determinations are consistent, even though there is a bias due to the different *Gaia* data releases adopted in our work (EDR3) and in Cantat-Gaudin & Anders (2020; DR2).

[14] This apparent discrepancy is due to the fact that our catalogue includes merged clusters that can include more than one cluster in the Cantat-Gaudin & Anders (2020) list.

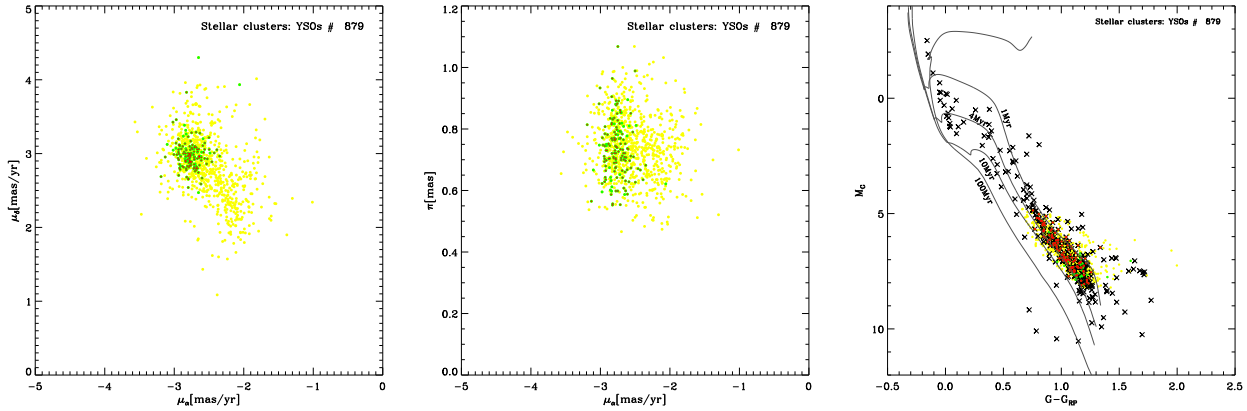

Fig. C.7. Proper motions in RA and Dec, parallaxes, and CAMDs of the YSOs associated with NGC 2362. Symbol colours are as in Fig. C.6. Black x symbols are the X-ray-detected YSOs by Damiani et al. (2006). Four representative solar metallicity isochrones from the Pisa models are also shown.

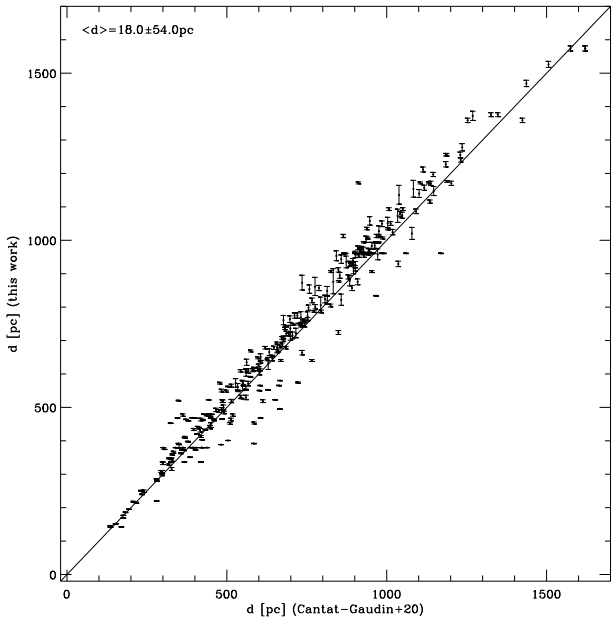

Fig. C.8. Comparison between cluster distances derived by Cantat-Gaudin & Anders (2020) and those derived in this work. The line with slope one is shown for guidance.