A0085 – This is one of the best studied substructured rich clusters in the literature (*e.g.*, Durret *et al.* 1989; Caretta *et al.* 2008; Bravo-Alfaro *et al.* 2009; Habas *et al.* 2018; Bravo-Alfaro *et al.* 2022). It is a member of Pisces-Cetus-N Supercluster (MSCC 39; *e.g.*, Porter & Raychaudhury 2005; Chow-Martínez *et al.* 2014). Its ICM was detected and studied in almost every X-ray survey (*e.g.*, Pislar *et al.* 1997; Lima-Neto *et al.* 2001; Kempner *et al.* 2002; Tanaka *et al.* 2010; Schenck *et al.* 2014; Ichinohe *et al.* 2015), all showing strong evidences of previous and current mergers. These mergers form a sequence in a filament from the SB to the SE substructures. Although a SCC cluster (*e.g.*, Käfer *et al.* 2019), A0085A has been classified as not-relaxed/disturbed from X-ray studies (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019), and presents radio-relics (*e.g.*, Slee *et al.* 2001; Feretti *et al.* 2012). Its CDG, Holm15A, a classical cD-type galaxy ($\Delta m_{12} = 1.53$), is almost coincident with the X-ray peak and consistent with no peculiar velocity, although displaced from the galaxy density peak due to the weight of the substructures aligned along a filament from SE.

A0118 and A0122 – These clusters are members of NE portion of Sculptor Supercluster (MSCC 33), very close in proyection (2.95 h_{70}^{-1} Mpc separation) and redshift ($\Delta v_{cl} = 225$ km s^{-1}). Our gravitational bounding analysis suggests they are a bounded pair. Their ICM was detected for the first time by HEAO 1 X-ray satellite (A-1 instrument survey; Kowalski *et al.* 1984), respectively with notes "confused" and "upper limit". A0122 was also detected in ROSAT data (*e.g.*, Vikhlinin *et al.* 1998). Our temperature measurement for this cluster gives a value of 3.70±0.07 keV. No information about the dynamical status of their ICM was found in the literature. A0118e and A0118c subclusters seem to be part of a bridge of groups between A0122 and A0118**m**. A large projected offset was found for A0122, while both present large CDG peculiar velocities. A0122 CDG is a typical "pile-up" cannibal galaxy, with a "dumbell" and other two smaller galaxies sharing the same brighteness contour.

A0119 – Member of a poor supercluster (MSCC 045; Chow-Martínez *et al.* 2014), with a multiplicity $m = 4$, A0119 is a NCC cluster (*e.g.*, Käfer *et al.* 2019) with substructures detected both in the optical (S cluster) and in X-rays (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019), as well as a significant $\Delta r_{\rm ox}$.

A0133A – A SCC cluster (*e.g.*, Käfer *et al.* 2019), member of Pisces-Cetus-C Supercluster (MSCC 27; *e.g.*, Porter & Raychaudhury 2005; Chow-Martínez *et al.* 2014). Although Parekh *et al.* (2015) classified this cluster as relaxed, optical (Randall *et al.* 2010) and X-ray (Connnor *et al.* 2018) features were detected, as well as sloshing and a radio relic (Slee *et al.* 2001; Randall *et al.* 2010). Furthermore, the cD-type CDG projected offset and peculiar velocity are both significant.

A0399 and A0401 – These two clusters were also considered as a bounded pair by our gravitational bounding analysis. Their projected separation and radial velocity difference are, respectively, 3.03 h_{70}^{-1} Mpc and 915 km s^{-1}. By using ASCA satellite data, Fujita *et al.* (1996) concluded that the pair is in a pre-merging phase. This picture was reinforced by XMM-Newton data (Sakelliou & Ponman 2004), although the abscence of a CC in both clusters and small temperature inhomogeneities in their central regions suggest previous individual mergings. Both are classified as U clusters, with no substructures detected in their outermost regions, but present disturbed X-ray emissions (Parekh *et al.* 2015; Lovisari *et al.* 2017) and radio relics (*e.g.*, Murgia *et al.* 2010; Feretti *et al.* 2012). Another interesting feature is a bridge of gas connecting the pair, detected from Planck's thermal SZ signal (Bonjean *et al.* 2018). A0399 has a perturbed CDG, but A0401 not, both cD-type galaxies. As a comparison standard, we measured the temperature of A0399, 6.49±0.27 keV, similar to the value 6.69 of Migkas *et al.* (2020).

A0400 – Although it was identified as an isolated cluster in MSCC, it is known that this is the main cluster of a nearby poor supercluster, known as Southern Great Wall (*e.g.*, Da Costa *et al.* 1988; Böhringer *et al.* 2021) or Sculptor Wall (do not confuse with the Sculptor Supercluster at z $\sim$ 0.11). A0400 is a NCC cluster (Käfer *et al.* 2019) with irregular ICM morphology and centroid shift (*e.g.*, Buote & Tsai 1996; Schuecker *et al.* 2001), also known to present substructures in the optical (Beers *et al.* 1992). Our analysis revealed a perturbed CDG, with both significant projected offset and peculiar velocity. The CDG (3C 75) is a dumbell, doubled Wide-Angle Tailed (WAT) radio galaxy, presenting a proto supermassive binary black hole (Hudson *et al.* 2006).

A0426 – The Perseus Cluster, A0426A, is the main cluster of the Perseus-Pisces Supercluster (MSCC 96). Typical P cluster according to our classification scheme, it presents a global east-west asymmetric ICM profile, aligned with the chain of bright galaxies, with a sloshing cold front in its CC (*e.g.*, Churazov *et al.* 2003; Walker *et al.* 2018). A mini radio halo was also found in this cluster (*e.g.*, Feretti *et al.* 2012). It is also known to have cavities (inflated bubbles) from the central AGN feedback (Böhringer *et al.* 1993), inside a 25 kpc radius, and Hα filaments (Conselice *et al.* 2001), inside a 70 kpc radius. No significant offset or peculiar velocity were found for NGC 1275, the CDG.

A0496 – Also identified as an isolated cluster in MSCC, but probably part of a poor supercluster (Boué *et al.* 2008; Bravo-Alfaro *et al.* 2022). Long considered a relaxed cluster (*e.g.*, Durret *et al.* 2000), our analysis revealed a significant substructure at NW. A0496 is a SCC cluster (Käfer *et al.* 2019), with disturbed ICM (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019) and sloshing, consequent of a probable minor merger that crossed

the cluster from SW to NE (Roediger *et al.* 2012). Our measurements show a quiet cD-type ($\Delta m_{12} = 1.13$) CDG, confirming previous estimates (*e.g.*, Malumuth *et al.* 1992).

A0539 – Isolated NCC cluster (Lakhchaura & Singh 2014), first studied by Ostriker *et al.* (1988). No information about the dynamical status of its ICM was found in the literature. The Chandra X-ray image of the cluster (Lakhchaura & Singh 2014) shows a double peak at the center, separated by ∼26 kpc, roughly coincident with the CDG (together with two smaller galaxies at S) and a dumbbell galaxy at N that share the same isofote of the other three at S. Since the temperature at both X-ray peaks is lower than the surroundings, it is supposed to be a result of cold gas stripped off from the two galaxies, as a result of interactions between them in a pre-merging phase. The CDG seems to be closely at rest in projection, but presents a significant peculiar velocity.

A0576 – Although isolated according to MSCC, there is a possible bridge connecting A0576 to the pair of clusters UGC 3957–DA 240 (Chen *et al.* 2011) at E. It is a non-relaxed (Parekh *et al.* 2015) WCC cluster (Käfer *et al.* 2019). Its dumbbell CDG is displaced from the X-ray peak and presents a non significant peculiar velocity.

A0634 – Unimodal poor cluster with no X-ray emission detected yet and with a CDG without significant peculiar velocity.

A0754 – It is a NCC cluster (Käfer *et al.* 2019), prototype for merging of subclusters in progress (strong non-relaxed, according to Parekh *et al.* 2015). While the galaxy distribution shows a clear bimodal pattern (M class in our analysis), the ICM X-ray emission is elongated and curved towards the easthern clump, forming a bar almost perpendicular to the supposed collision axis (Zabludoff & Zaritsky 1995). The temperature morphology is also nonisothermal (Roettiger *et al.* 1998), with a clear shock front (Macario *et al.* 2011), a radio halo and radio relics (Kale & Dwarakanath 2009; Feretti *et al.* 2012). The brightest CDG, in the W main subcluster, is clearly dynamically disturbed, with both compelling projected offset and peculiar velocity. A0754 makes a pair with A0780 (Chow-Martínez *et al.* 2014), also known as Hydra-A cluster.

A1060 – The nearby Hydra-I cluster, main cluster of the Hydra-Centaurus Supercluster (MSCC 365, also part of Laniakea), is a WCC/NCC cluster (Käfer *et al.* 2019; Hayakawa *et al.* 2006), with very few information about the dynamical status of its smooth and symmetric ICM, although well observed in X-rays (*e.g.*, Singh *et al.* 1988; Hayakawa *et al.* 2004, 2006). Its CDG, NGC 3311, is a quiet cD-type galaxy, with no significant projected displacement or peculiar velocity. We consider the second brightest, NGC 3309, separated in projection by only about 25 h_{70}^{-1} kpc from the CDG but with a large redshift difference ($\Delta v = 265$ km s^{-1}),

the second non-interacting CDG (binary CDG in Table 4) (*e.g.*, Ventimiglia *et al.* 2011).

A1367 – The NCC (*e.g.*, Käfer *et al.* 2019) Leo cluster, member of the Coma-Leo Supercluster (MSCC 295), is clearly a disturbed ICM cluster (Laganá *et al.* 2019), with two subclusters merging along the SE–NW direction(*e.g.*, Cortese *et al.* 2004). This is also the direction of a galaxy filament pointing towards the Virgo cluster and connecting the two superclusters (West & Blakeslee 2000). Assuming a collision in the plane of the sky, calculations suggest that the two subclusters passed through each other ∼0.7 Gyr ago (Ge *et al.* 2019). It also presents radio relics (Feretti *et al.* 2012). The two X-ray emission peaks coincide with the two CDGs, NGC 3842 (NW) and NGC 3862 (SW), separated by about 680 h_{70}^{-1} kpc in projection. As expected, the brightest CDG (NW) presents both significant projected offset and peculiar velocity.

A1644 – This SCC cluster (Käfer *et al.* 2019) makes a pair with A1631 according to MSCC (Chow-Martínez *et al.* 2014). Previous studies have pointed this pair as a northwestern extension of the Shapley Supercluster. Although our analysis indicates that only non significant substructures are present (P class), in accordance with previous works based on galaxy distribution (*e.g.*, Tustin *et al.* 2001), the X-ray emission shows a clear bimodal structure, with a subcluster at NE (A1644-N) almost as massive as the main one (A1644-S; *e.g.*, Jones & Forman 1999; Reiprich *et al.* 2004). It is supposed that a cross between 0.7–1.6 Gyr ago produced a cold spiral trail associated to the gas slosh of the main cluster core (*e.g.*, Johnson *et al.* 2010). Weak-lensing data suggest that, in fact, A1644-N is a pair of substructures, with a no X-ray emitting clump, A1644-N2, at W of the X-ray emitting A1644-N1 (Monteiro-Oliveira *et al.* 2020). The cD-type CDG of the main cluster presents a significant projected offset but no compelling peculiar velocity.

A1650 and A1651 – Both are members of the Sloan Great Wall Supercluster (SGW, MSCC 376), separated by 2.4 deg in the plane of the sky. They are inside the surveyed areas of both SDSS and 2dFGRS. Both are also WCC clusters (Käfer *et al.* 2019), A1650 considered to have a relaxed ICM and A1651 a disturbed one (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019; Takahashi & Yamashita 2003). There is also evidence for substructuring in the distribution of galaxies for A1651 in the literature (Hwang & Lee 2008), not confirmed by our analyses. Both have cD-type CDGs, considered at rest in their respective potential well.

A1656 – The famous Coma cluster, member of the Coma-Leo Supercluster (MSCC 295), is also a NCC cluster (*e.g.*, Käfer *et al.* 2019). Although considered to have a relaxed ICM (Laganá *et al.* 2019) in its central region (the first prototype of a relaxed cluster), it presents a radio halo and relics (Feretti *et al.* 2012). In fact, it is now long known that it

presents at least one major substructure at SW, centered at NGC 4839, a cD-type galaxy, and a minor substructure at SE, centered at NGC 4911, both from X-rays (*e.g.*, Briel *et al.* 1992) and optical (*e.g.*, Colless & Dunn 1996; Adami *et al.* 2005) data. The NGC 4839 substructure has probably already crossed the main structure some Gyr ago (Churazov *et al.* 2021). Its BCG, NGC 4889, a D-type galaxy, is recognized as the second rank galaxy (Baier *et al.* 1990; Colless & Dunn 1996), being NGC 4874 ($\Delta m_{12} = -0.53$), a cD-type and the closest to the X-ray emission peak, the main CDG of the system. The relatively recent incorporation of the group of NGC 4889 (*e.g.*, Fitchett & Webster 1987; Adami *et al.* 2005) probably moved NGC 4874 from the potential well (significant offset), but not enough to generate an important peculiar velocity.

A1736 – Two clear components are identifiable in LOS direction: A1736A and A1736B (*e.g.*, Dressler & Shectman 1988). The first one is, in fact, a collection of at least 4 galaxy groups. A1736B, the richer one, is a substructured cluster with the X-ray emission peak centered on the substructure. These two components are well separated in redshift space, enough for guarantee the unboundedness of the "pair". A1736B, a NCC cluster (Käfer *et al.* 2019) with disturbed ICM (Parekh *et al.* 2015), is also considered to be part of the Shapley Supercluster (MSCC 389), possibly bound to A3559 (Pearson & Batuski 2013). The CDGs of both A and B componets present no peculiar velocity, but the CDG of A1736B show a significant projected offset.

A1795 – The strong relaxed ICM (Buote & Tsai 1996; Parekh *et al.* 2015; Laganá *et al.* 2019) and SCC (Käfer *et al.* 2019) cluster A1795 is also a frequently X-ray observed cluster (*e.g.*, Tamura *et al.* 2001; Bautz *et al.* 2009; Kokotanekov *et al.* 2018). It is a member of the Böotes Supercluster (MSCC 414). However, its core presents special features like a 60 h_{70}^{-1} kpc filament detected originally in Hα (Cowie *et al.* 1983), and then in UV (McNamara *et al.* 1996) and X-rays (Fabian *et al.* 2001). From the measured cool temperature of the filament gas, A1795 was considered a prototype of cooling flow, being the observation of its X-ray emission progressively improved from Chandra calibration images till a record of 3.4 Ms, reveling, for example, a new feature called "the hook" (*e.g.*, Ehlert *et al.* 2015). Our results show a quiet cD-type CDG, presenting minor both projected offset and peculiar velocity.

A2029 – It is part of MSCC 457 Supercluster ($m = 6$; Chow-Martínez *et al.* 2014), and locally forms a complex structure with other two infalling poor clusters: A2033 at N, and another, called SIG, towards S. The three clumps emitt in X-rays and present weak-lensing signal (*e.g.*, Gonzalez *et al.* 2018; Sohn *et al.* 2019a). It is one of the best-sampled clusters in terms of spectroscopic redshifts (*e.g.*, Sohn *et al.* 2019b). Concerning ICM dynamical state, the estimates indicate both relaxed (Buote

& Tsai 1996; Parekh *et al.* 2015) and disturbed (Laganá *et al.* 2019) possibilities. Also, it is a SCC cluster (Käfer *et al.* 2019), but presents a mini radio halo (Feretti *et al.* 2012). The central region of A2029 shows a sloshing cold front pattern (Clarke *et al.* 2004), out to more than 150 kpc, probably from a previous merger 2-3 Gyr ago (Paterno-Mahler *et al.* 2013). The cD-type CDG, NGC 1101, one of the largest and most luminous known galaxies (about 607 kpc diffuse light envelope; Uson *et al.* 1991), presents both significant projected offset and peculiar velocity.

A2040 – Possibly a cluster pair with MKW3s cluster, and member of the MSCC 454 Supercluster ($m = 6$; Chow-Martínez *et al.* 2014), behind the Hercules-S Supercluster. No previous study of its ICM dynamical state was found. Its CDG shows a high peculiar velocity.

A2052 and A2063 – Another probably bounded pair, according to our analysis, part of the Hercules-S Supercluster (MSCC 458). Both have uncertain ICM dynamical state: relaxed, according to Laganá *et al.* (2019), or non-relaxed, according to Parekh *et al.* (2015). A2052 presents a cold front sloshing (*e.g.*, Blanton *et al.* 2011) extending more than 250 kpc, associated to a possible subcluster cross 2.6 Gyr ago (Machado & Lima-Neto 2015), and a complex system of X-ray cavities, while A2063 shows radio relics (Feretti *et al.* 2012). A2052 is SCC, while A2063 is WCC cluster (Käfer *et al.* 2019). Both CDGs are dynamically quiet from our analyses.

A2065 – It is the richest member cluster of the Corona Borealis Supercluster (MSCC 463), also called CrB cluster itself. Due to a hot merger shock at SE of the cluster X-ray peak (Markevitch *et al.* 1999), and the elongation of this peak towards NW, coincident with the second nucleus of the dumbbell CDG (*e.g.*, Chatzikos *et al.* 2006), an ongoing merger of a subcluster (with a core crossing only a few Myr ago) is estimated. Thus, the NW less luminous central galaxy could be the CDG of the less massive subcluster, fallen from the SE. This subcluster is not detected from the distribution of galaxies. This is also consistent with the diagnostic of a disturbed ICM (Parekh *et al.* 2015; Laganá *et al.* 2019) and the WCC (Käfer *et al.* 2019).

A2142 – According to MSCC (Chow-Martínez *et al.* 2014), it makes a pair with A2148. In the literature, this pair (and a large filament of groups and galaxies) is also known as the A2142 Supercluster (*e.g.*, Einasto *et al.* 2015). It is considered a "rare" case of WCC (Käfer *et al.* 2019) with four cold fronts (three in the core and one towards NW at about 1 Mpc from the center; *e.g.*, Wang & Markevitch 2018). Besides the disturbed ICM (Parekh *et al.* 2015; Laganá *et al.* 2019), a mini radio halo is also found (*e.g.*, Feretti *et al.* 2012; Venturi *et al.* 2017). Our analyses indicate a P class cluster possibly because our spectroscopic sample only enables to detect part of the infalling groups at NW (*e.g.*,

Einasto *et al.* 2018; Liu *et al.* 2018). Both projected offset and peculiar velocity are high.

A2147, A2151 and A2152 – These clusters are members of the well known Hercules-C Supercluster (MSCC 474), with A2151 being the Hercules cluster itself. This seems to be a very young/active region, with clusters very far from equilibrium. A2147 has two main subclusters, A2147ms and A2147mn; and two significant minor substructures, A2147se, being itself a bimodal substructure, and A2147s (in agreement with, *e.g.*, Lugger 1989). A2151 has three main subclusters, A2151mc [or A2151C(F)], A2151mw [or A2151C(B)] and A2151mn, two significant substructures (A2151e and A2151sw), three of them detected originally by Bird *et al.* (1993) and the last by Huang & Sarazin (1996); and two other low significance substructures. These two complex systems revealed to be gravitationally bounded from our analysis, in agreement with previous estimates (*e.g.*, Barmby & Huchra 1998). A2152A, on the other hand, itself another bimodal cluster, seems not to be bounded to the previous ones. Concerning their ICM (Magri *et al.* 1988), the NCC (*e.g.*, Käfer *et al.* 2019) A2147 is considered very disturbed (Parekh *et al.* 2015; Laganá *et al.* 2019). A2151 ICM X-ray emission has a main bimodal structure, with the brightest mode, a SCC, in the W subcluster (*e.g.*, Tiwari & Singh 2021). Nevertheless, we did not flag the center of the cluster at the W subcluster, but at the central and richer one (see also, Agulli *et al.* 2017). A2147 has a binary CDG, UGC 10143, the brightest and a dominant galaxy with both significant projected offset and peculiar velocity, and MCG $+03-41-051$. The CDG (of the main and central subcluster) of A2151, NGC 6047, is not its BCG, and shows a significant peculiar velocity respect to A2151. The BCG, on the other hand, is NGC 6041, being the CDG of the W subcluster. Other dominant galaxies are the CDG of the N mode, NGC 6061, and the brightest galaxy of the C mode, NGC 6045, this last one a probable star-burst spiral. Finally, the A2152A also has two CDG, one for each mode subcluster. The ICM X-ray peak of A2152A is offset and closer to another pair of bright galaxies, in the background cluster A2152B, and may be contaminated by the emission of this background system (Blakeslee *et al.* 2001).

A2197 and A2199 – This is the classical Hercules-N Supercluster (*e.g.*, Gregory & Thompson 1984; Rines *et al.* 2001), MSCC 485, considered to be gravitationally bounded by our analysis and other previous ones (*e.g.*, Krempéc-Krygier *et al.* 2002). A2197 is a multimodal and less massive cluster, formed by three subclusters: A2197mc, A2197me (repectively A2197W and A2197E according to Rines *et al.* 2002) and A2197mw (this last one with a less bright X-ray counterpart). Both A2197mc and A2197me are WCC subclusters (Finoguenov *et al.* 2001). A2199, a P class cluster from our analysis and in accordance with the results by Song *et al.* (2017), is a SCC cluster (*e.g.*, Käfer *et al.* 2019) with a dis-

turbed ICM (Parekh *et al.* 2015; Laganá *et al.* 2019). Sloshing, supposed to be associated to a core crossing substructure about 400 Myr ago, is also present (Nulsen *et al.* 2013). The main CDG of A2197, NGC 6160, shows both relatively large projected offset and peculiar velocity. CDGs of A2197me and A2197mw are, respectively, NGC 6173 and NGC 6146. NGC 6166, the cD-type CDG of A2199, presents a relatively large peculiar velocity (in agreement with Bender *et al.* 2015).

A2204 – This is the farthest cluster in our sample, at ~ 0.15, which puts it out of MSCC. It is a strong-relaxed (Buote & Tsai 1996; Parekh *et al.* 2015) SCC cluster (Sanders *et al.* 2005; Käfer *et al.* 2019). Sloshing cold fronts are found between 35 and 65 kpc of the X-ray centroid (Chen *et al.* 2017). Three BCGs occupy the central core of the cluster, being the CDG (the one labelled A in Chen *et al.* 2017, probably interacting with B object, leaving us to flag the two as a db system in the present work) the one that presents clear star formation (Oonk *et al.* 2011). The CDG presents a compelling projected offset.

A2244 – It is a WCC cluster (Käfer *et al.* 2019), member of MSCC 492 ($m = 3$; Chow-Martínez *et al.* 2014). Its dynamical state is dubious: non-relaxed according to Parekh *et al.* (2015) and relaxed following Laganá *et al.* (2019). The cD-type CDG is closely at rest, and has a small companion deep inside its envelope, separated by only about 2.5 arcsec and 50 km s^{-1} (Schombert *et al.* 1989).

A2255 – By considering only ACO clusters, MSCC did not find A2255 as a member of a supercluster, but the analysis of a sample of X-ray detected clusters and groups pointed out its membership to the North Ecliptic Pole Supercluster (NEPSC, Mullis *et al.* 2001, and references therein). Its complex temperature structure suggests a recent merger, consistent with a core-crossing 0.1–0.2 Gyr ago (Sakelliou & Ponman 2006). This disturbed (Laganá *et al.* 2019) NCC cluster (Käfer *et al.* 2019) also shows a remarkably complex Mpc-scale radio halo and relics (*e.g.*, Feretti *et al.* 2012; Botteon *et al.* 2020). It is also one of the best-sampled clusters in terms of spectroscopic redshifts (*e.g.*, Tyler *et al.* 2014). The two BCGs present a large projected offset respect to the X-ray centroid (Burns *et al.* 1995) and a large difference in their peculiar velocities (more than 2 500 km s^{-1}). The brightest of them, the one at SW (ZwCl 1710.4+6401 A), is the main CDG and presents a peculiar velocity of -1 905 km s^{-1}, while the NE one (ZwCl 1710.4+6401 B) is the one usually considered the CDG in the literature because its peculiar velocity is closer to the cluster velocity.

A2256 – Member of the poor MSCC 495 supercluster ($m = 3$; Chow-Martínez *et al.* 2014), A2256 is long belived to be a merging cluster, both from optical, X-ray and radio data. Our substructuring analysis indicates two significant substructures, a group in the foreground and a subcluster in

the background, in accordance with different studies in the literature (*e.g.*, Berrington *et al.* 2002; Miller *et al.* 2003). X-rays observations show a strong non-relaxed (Parekh *et al.* 2015) NCC cluster (Käfer *et al.* 2019), with two main peaks, associated to the primary cluster and the subcluster, and a "shoulder" (*e.g.*, Briel *et al.* 1991; Sun *et al.* 2002); while radio wavelenghts reveal a complex pattern with a radio halo, relics and several head-tail radio galaxies (*e.g.*, Bridle & Fomalont 1976; Feretti *et al.* 2012). Although the CDG (UGC 10726) clearly presents a projected offset, its peculiar velocity is small. The second and third BCGs (G2 and G3 in Ge *et al.* 2020) are respectively the dumbell NGC 6331 and CGCG 355-026, both with small magnitud gaps.

A2634 – It makes a pair with A2666, according to MSCC and previous estimates, although it is not clear if they are gravitationally bound (*e.g.*, Scodeggio *et al.* 1995, and references therein). A2634 is a WCC cluster (Käfer *et al.* 2019) with a relaxed ICM (Vikhlinin *et al.* 2009). Its CDG, NGC 7720, is a noticeable dominant galaxy: it harbors a large WAT radio source (3C 465) (*e.g.*, Eilek & Owen 2002) and has a secondary nucleus only 6.7 h_{70}^{-1} kpc north and about 1 000 km s^{-1} away (*e.g.*, Pinkney *et al.* 1993, and references therein). It presents a small projected offset and no significant peculiar velocity according to our results.

A2670 – Probably isolated cluster (at least respect to other ACO clusters), its dynamical state is not completely clear according to previous estimates. Bird (1994) found indications of substructuring along the LOS and close to the core, not confirmed by Serna & Gerbal (1996), both from the same data (Sharples *et al.* 1988). With more data, Bravo-Alfaro *et al.* (2022) show evidence of 3 substructures in the outermost part of the cluster. The ICM of A2670 is relatively regular, with the CC (White 2000) exibiting a secondary emission peak in a cometary form (Fujita *et al.* 2006, and references therein). The large peculiar velocity of the CDG is long known (*e.g.*, Oegerle & Hill 2001), confirmed by our analyses, which also show significant projected displacement.

A2798, A2801, A2804 and A2811 – These clusters are members of the core of Sculptor Supercluster (MSCC 33). The first three were considered gravitationally bounded by our boundedness criterion. Also for comparison, we measured the temperature of A2811B, 5.04±0.05 keV, slightly lower than the value in Migkas *et al.* (2020) (5.89 keV). According to Sato *et al.* (2010), A2801, A2804 and A2811B are NCC (see also, Sivanandam *et al.* 2009, for A2811B). A2811B is considered to have a single-component ICM and A2804 a bimodal one (Kolokotronis *et al.* 2001). The ICM of A2798B, A2801 and A2811B were also studied by Obayashi *et al.* (1998). A2798B has a perturbed CDG, with significant both projected offset and peculiar velocity, while the CDGs of A2801, A2804 and A2811B do not show signs of disturbance.

A2870 and A2877 – A2870 shows a bimodal structure, completely inside the caustics of A2877, obviously a case of gravitationally bounded structure. In fact, the complex was considered to be a unic cluster in our analysis, with A2877 being the main structure, and A2870e and A2870w forming a kind of tail from the first. They are members of the Phoenix Supercluster (MSCC 41). We could measure a temperature for A2870 substructure, 1.07±0.07 keV. A2877 is a WCC cluster according to the t_{cool} estimated by Lovisari *et al.* (2015). A large projected offset of the CDG (IC 1633) was found, consistent with previous estimates (*e.g.*, Sivanandam *et al.* 2009).

A3027 – This substructured cluster, isolated according to MSCC (Chow-Martínez *et al.* 2014), makes a pair with AM0227-334/EDCC 653. They are inside the region surveyed by 2dFGRS (Hilton *et al.* 2005). Both the main structure and the substruture (grouping C in Burgett *et al.* 2004) present X-ray emission, as well as AM0227-334, detectable in ROSAT images. The CDG of A3027 presents a significant projected offset and no relevant peculiar velocity.

A3094 and A3095 – In Burgett *et al.* (2004) they correspond respectively to the W and E groupings of A3094. Although very close in projection (separated by only 1.52 h_{70}^{-1} Mpc), they did not pass our criterion for boundedness. This may still be a case of interacting systems, A3095 being a satellite or flyby group. They are members of MSCC 114 supercluster (Chow-Martínez *et al.* 2014). Our temperature measurement for A3094A cluster gives a value of 3.15±0.48 keV. They are also inside the region surveyed by 2dFGRS (Hilton *et al.* 2005). The CDG of A3094A shows significant projection offset but no compelling peculiar velocity, while the one of A3095 presents significant peculiar velocity.

A3104, S0334, S0336 and A3112 – These are member clusters of the Horologium-Reticulum-B Supercluster (MSCC 115), forming a gravitationally bounded system according to our analysis. In fact, S0334 and S0336 are poor clusters composing a bridge between A3104 and A3112. A3112 is a relaxed (Parekh *et al.* 2015; Lovisari *et al.* 2017) SCC cluster (Käfer *et al.* 2019; Bulbul *et al.* 2012). Its ICM presents a clear elliptical shape, along N-S axis (*e.g.*, Sivanandam *et al.* 2009), as well as its galaxy distribution, coincident with the direction of S0334. The CDG of A3104 presents a significant projection offset but not a compelling peculiar velocity, while the cD-type CDG of A3112 seems undisturbed.

A3158 – This substructured cluster is the most massive cluster of Horologium-Reticulum-A Supercluster (MSCC 117). There are clear evidences of a bridge of galaxies connecting this cluster with the double-cluster A3125/A3128 (see Johnston-Hollitt *et al.* 2008, and references therein). Its ICM is non-relaxed (Parekh *et al.* 2015) and it carries a NCC (Käfer *et al.*

2019). A3158 resembles the Coma cluster, harboring 3 dominant galaxies (*e.g.*, Havlen & Quintana 2004), two in the main structure and one in a substructure (as proposed originally by Lucey *et al.* 1983). The substructure, instead, is projected almost in the same LOS of the main structure. Concerning the binary CDG, separated by only about 80 h_{70}^{-1} kpc in the plane of sky (Wang *et al.* 2010), the main one is centered close to the X-ray centroid and presenting a significant peculiar velocity.

A3391 and A3395 – Although separated by only about 3 h_{70}^{-1} Mpc in projection and 1 900 km s^{-1} along the LOS, these clusters were considered unbounded by our analysis, confirming previous estimations (Henriksen & Jones 1996). They are members of MSCC 160 Supercluster ($m = 3$; Chow-Martínez *et al.* 2014). A3391 is a regular ICM cluster, containing a dumbbell cD galaxy (Teague *et al.* 1990), while A3395 has a multimodal ICM, dominated by the NE and SW subclusters, the two modes probably approaching first core crossing (*e.g.*, Donnelly *et al.* 2001). A third X-ray substructure of A3395, at NW, was also previously reported by Tittley & Henriksen (2001), as well as a forth one, at W, by Lakhchaura *et al.* (2011), both not detected in our analyses. Both A3391 and A3395 are non-relaxed (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019) and NCC clusters (Käfer *et al.* 2019, the SW subcluster, in the case). Recent eROSITA data for the region reveal a bridge of warm gas between A3391 and A3395, extending for at least 3 h_{70}^{-1} Mpc perpendicular to their line of separation (Reiprich *et al.* 2021), confirming previous estimations (*e.g.*, Tittley & Henriksen 2001; Planck Collab. 2013). This bridge contains the ESO 161-IG006 group (see, also, Alvarez *et al.* 2018, and references therein) and, according to the authors, is part of a larger 15 h_{70}^{-1} Mpc WHIM filament, including a branch towards a Northern Clump, another towards a Little Southern clump and a third one towards east. The ESO 161-IG006 group corresponds to our A3395NW substructure. Both A3391 dumbbell CDG and A3395 CDG (in NE subcluster) show significant peculiar velocity.

A3526 – At least two components along the LOS are clearly identifiable in this direction: A3526A, the classical Centaurus Cluster (also known as Cen30), and A3526B (Cen45) (Lucey *et al.* 1986). They are members of the Hydra-Centaurus Supercluster (MSCC 365). Although they are well separated in the redshift space (1 643 km s^{-1}), resulting in an unbounded case according to our analysis, there are evidences from the ICM that they are interacting (Cen45 being hotter than expected; Churazov *et al.* 1999; Walker *et al.* 2013). In fact, distance measures for the two CDGs and for other few members suggest a close distance between the two subclusters, Cen45 being possibly a subgroup falling into but not having reached Cen30 yet (Mieske & Hilker 2003). A3526A is a SCC cluster (Käfer *et al.* 2019), presenting sloshing cold gas motion (Sanders *et al.* 2016, and references therein). Both the CDG of A3526A, NGC 4696,

and the CDG of A3526B, NGC 4709, present no dynamical disturbance.

A3530 and A3532 – These clusters are part of the A3528 W subcore of Shapley Supercluster (MSCC 389), together with the double X-ray cluster A3528 (Bardelli *et al.* 2001). A3530 and A3532 were considered gravitationally bounded by our analysis, but a study of the ICM between the two clusters (Lakhchaura *et al.* 2013) revealed lower temperature and abundance than the clusters themselves, suggesting a no-merging status. Both A3530 and A3532 NCC clusters (Chen *et al.* 2007), and A3532 is considered to have a relaxed ICM (Laganá *et al.* 2019). A3530 possesses a binary CDG, and the main one shows a significant projected offset. A3532, on its turn, hosts a dumbbell CDG that presents both significant projected offset and peculiar velocity.

A3556, A3558 and A3562 – These three clusters form the main core of the Shapley Supercluter (MSCC 389), together with other galaxy groups or poor clusters, being A3558 the Shapley Cluster itself. The poor cluster SC1327-312 (also known as A3558b; see also Bardelli *et al.* 1996) was detected as a non-significant substructure of A3558 in our analysis. Our study suggests that the complex is gravitationally bounded. Pearson & Batuski (2013) concluded that also A3554 and A3560 are bound to the complex. A3556 is a multimodal X-ray cluster. Both A3558 and A3562 have non-relaxed ICM (*e.g.*, Parekh *et al.* 2015; Laganá *et al.* 2019) with WCC (Käfer *et al.* 2019). A probable sloshing cold front was also detected in A3558 (Rossetti *et al.* 2007). A3562 also contains a radio-halo (Feretti *et al.* 2012), particularly pointing its extended feature towards the poor cluster SC1329-313 (Giacintucci *et al.* 2005). This orientation and interconection (producing gas sloshing motion) is also seen in X-rays (Finoguenov *et al.* 2004). A3556 CDG shows no signs of dynamical disturbance, A3558 cD-type CDG presents significant peculiar velocity and A3564 CDG displays a compelling projected offset.

A3716 and S0906 – Again a case of two systems very close in projection (separated by only 1.67 h_{70}^{-1} Mpc), but probably unbounded. This may still be a case of interacting systems, S0906 being a satellite or flyby group. They are members of the SSCC 309, together with S0889 (Chow-Martínez *et al.* 2014). A3716 is a X-ray multimodal cluster (Andrade-Santos *et al.* 2015), with the N and S components probably gravitationally bound. We could measure a X-ray temperatures for both modes of A3716, giving 2.19±0.26 keV for A3716N and 3.65±0.27 keV for A3716S, consistent with the values estimated by Andrade-Santos *et al.* (2015). The CDG of A3716 (in the N subcluster) shows a significant peculiar velocity.

A4012 – It is a member of MSCC 584 ($m = 3$; Chow-Martínez *et al.* 2014), probably a bounded pair with A4013 (separated by only about 3.6 h_{70}^{-1} Mpc and 180 km s^{-1}, Burgett *et al.* 2004). No X-ray emission has been

detected for this cluster so far. Also, no significant peculiar velocity was found for its CDG.

A4038 and A4049 – Again a case of a main cluster, A4038A, and a pair of substructures (A4049n and A4049s) inside its caustics, forming a gravitationally bounded complex. Like A2877-A2870, this complex was considered to be a unic substructured cluster. Our temperature measurement for A4038A, 3.15±0.05 keV, is very close to the one in Migkas *et al.* (2020) (2.84 keV). They are also inside the region surveyed by 2dFGRS (Hilton *et al.* 2005). A bright star (SAO 192167) between the two subclumps has probably limited spectroscopy in the region (Burgett *et al.* 2004). A4038A is a WCC cluster (Käfer *et al.* 2019) with a disturbed ICM (Parekh *et al.* 2015; Laganá *et al.* 2019), and also contains a radio relic (Slee *et al.* 2001; Feretti *et al.* 2012).

S0373 – Although considered as isolated in MSCC, the Fornax cluster is known to be part of the Southern Supercluster (*e.g.*, Pellegrini *et al.* 1990), which also includes the groups in Eridanus complex and in Dorados (see, also, Nasonova *et al.* 2011). S0373 is a SCC cluster (*e.g.*, Käfer *et al.* 2019), presenting cold gas sloshing (Su *et al.* 2017) probably associated with a previous passage of NGC 1404 (the second BCG of the main structure) by the CDG, NGC 1399, about 1.1–1.3 Gyr ago from the northeast to the southwest, being now close to the point of its next encounter from the south (Sheardown *et al.* 2018, and references therein). NGC 1399 seems not to be dynamically disturbed.

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