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LOCAL GROUP SATELLITE ALIGNMENTS IN A COSMOLOGICAL CONTEXT: INSIGHTS FROM THE ILLUSTRIS SIMULATION

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ABSTRACT

Alineaciones.

Subject headings: Galaxies: halos — Galaxies: high-redshift — Galaxies: statistics — Dark Matter — Methods: numerical

1. INTRODUCTION

Observational evidence of planes is everywhere (where we can see them). MW, M31, Centaurus A.

Not so evident in simulations:

Millenium II Baumgardt, Ibata, Pawlowski

Clues Gillet est pero diferente

Plane claims:
Libeskind: preferential direction for accretion.
Sawala: planes are there when baryonic physics is included.
Buck: planes are easy to form at early times, when DM filaments are very thin. In high redshift galaxies galaxies, planes are everywhere.

Other explanations: Kroupa: tidal dwarfs
Fouquet

Following a bit on the claim by Sawala that barionic physics are important when looking for planes, WE look in Illustris and Elvis simulations to try and understand why barionic physics results in planar distribution of satellites.

2. SAMPLE SELECTION

3. RESULTS

4. METHOD

5. DISCUSSION

6. ACKNOWLEDGEMENTS

Gracias.

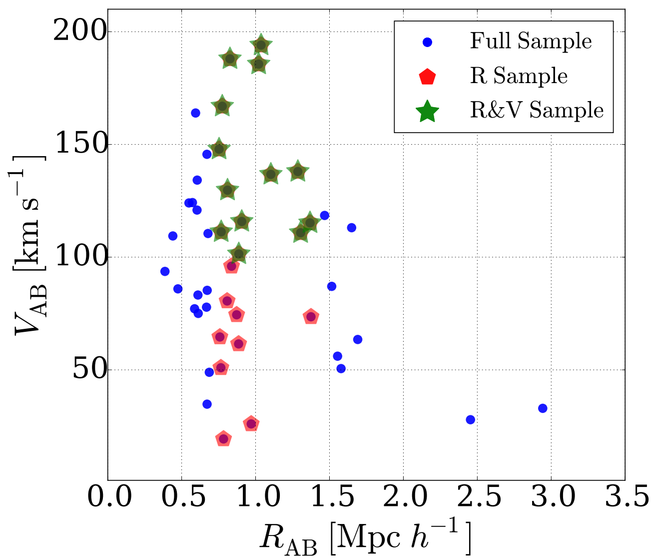

FIG. 1.— Halo pair samples used in this paper located in the plane of relative comoving velocity V_{AB} versus relative distance R_{AB} between the two halos in the pair. The R&V sample is the closest to the separation and kinematic conditions observed in the Local Group.

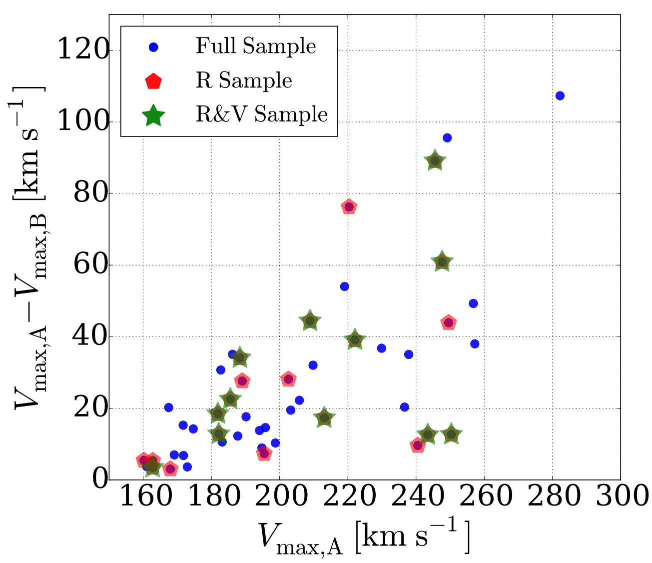

FIG. 2.— Diference between the maximum circular velocity V_{max} for the two halos in the pair as a function of V_{max} for the massive halo in the pair.

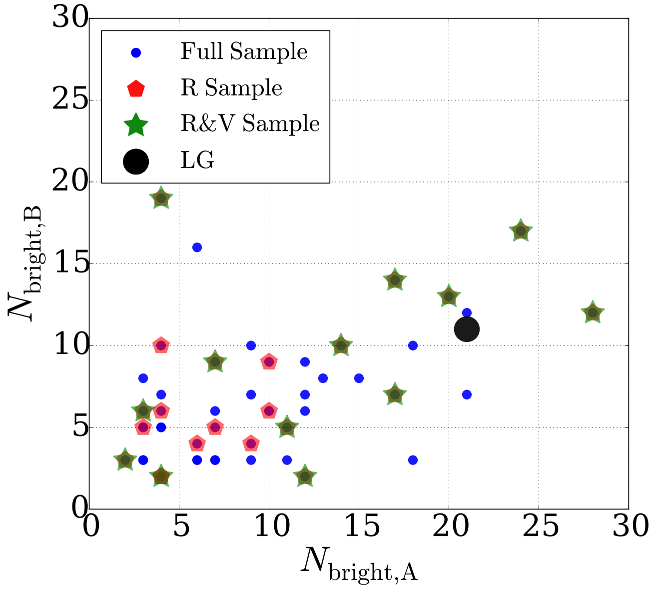

FIG. 3.— Number of bright substructures ($M_B < -9$) and dark matter substructures.

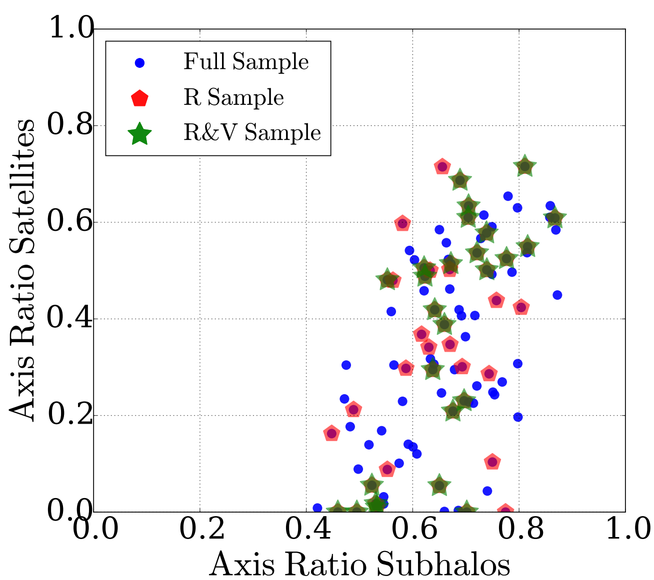

FIG. 4.— Axis ratio of luminous satellites versus the axis ratio for dark subhalos.

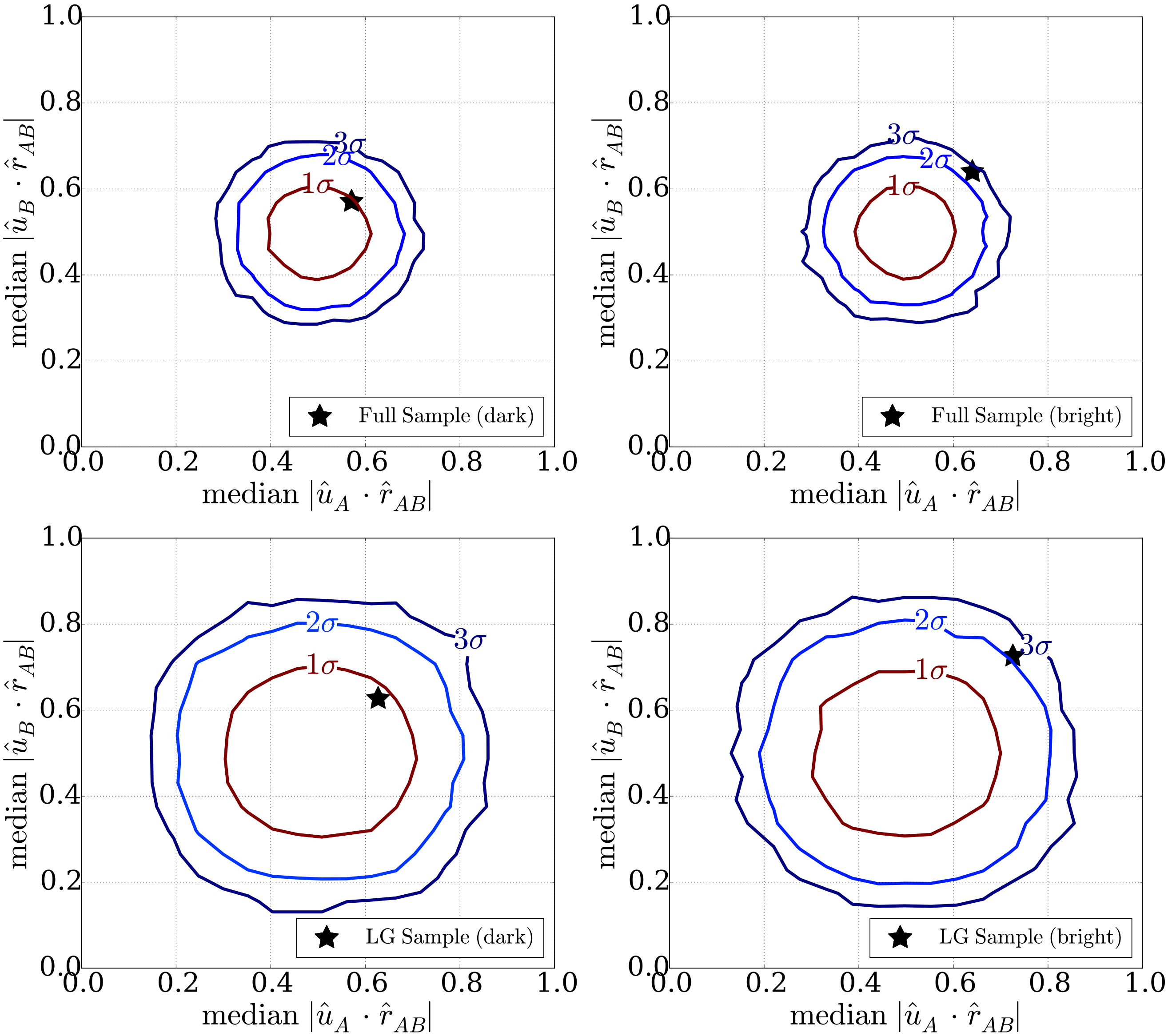

Fig. 5.— Significance of alignments.

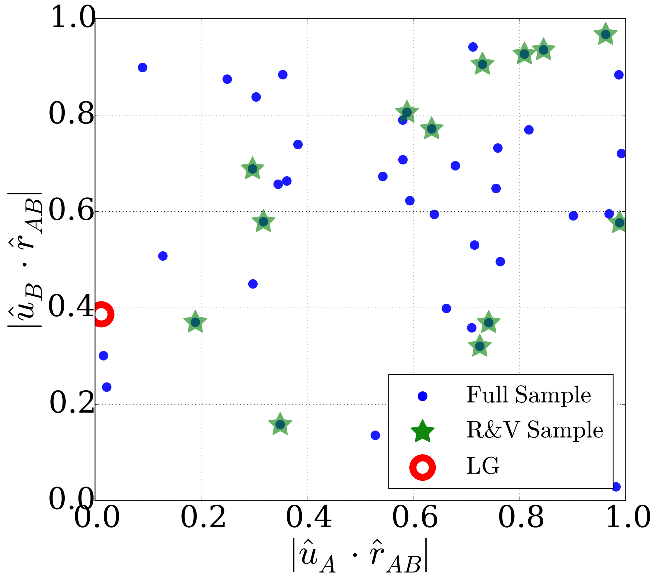

FIG. 6.— Alignment of the mayor axis with the vector connecting the two halos.

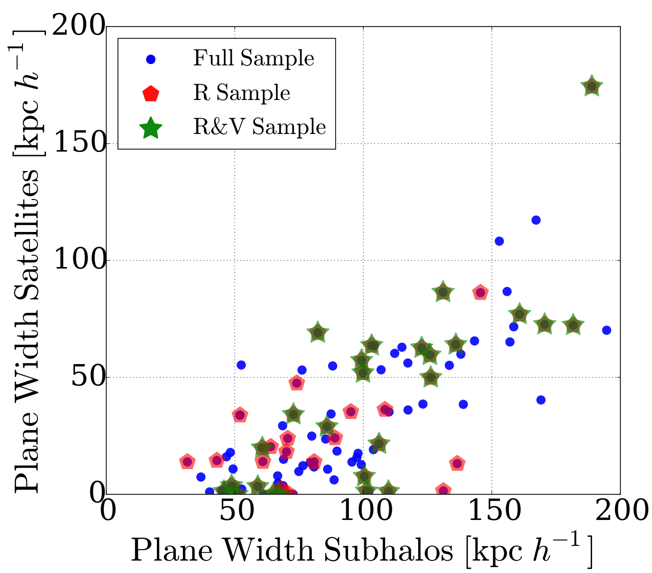

FIG. 7.— Plane width for the best planes in the luminious and dark cases.

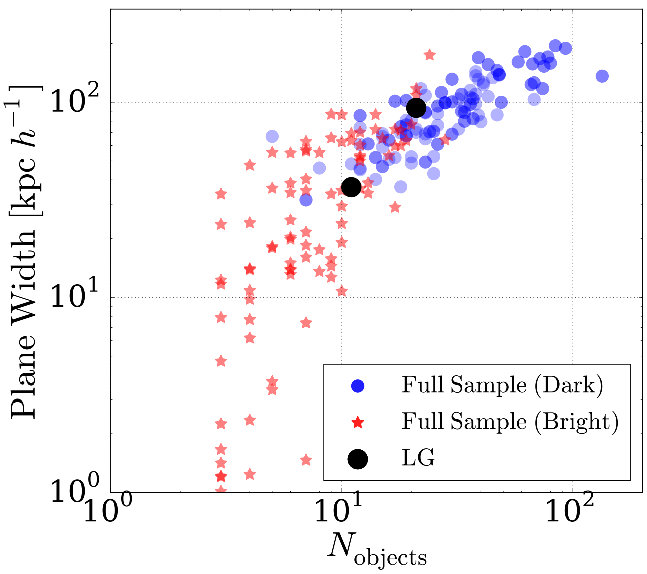

FIG. 8.— Plane width as a function of objects used to find the plane.