Structural alignment of the nIFTy cluster with cosmic web filaments in the local environment

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Objectives

This project makes use of the program DisPerSe to extract the filamentary structure using data from the nIFTy cluster, and by calculating the cluster axes and the filament average direction at the centre of mass of the cluster, determining the misalignment angle as a function of halo radius, for both dark matter and gas components of the cluster (as well as the temperature profile). This aim is achieved through the following processes:

1. Calculate the reduced moment of inertia tensor for the halo
2. Characterise the shape properties of the halo
3. Use DisPerSe to calculate filamentary structure
4. Investigate correlations between the above results

Introduction

Previous research has shown that the structural properties of dark matter haloes correlate with the local environment of the cosmic web in which they reside (such as filaments, walls and voids).

Materials & Methods

The following materials were required to complete the research:

- Curabitur pellentesque dignissim
- Eu facilisis est tempus quis
- Duis porta consequat lorem
- Eu facilisis est tempus quis

The following equations were used for statistical analysis:

$$\cos^3\theta = \frac{1}{4}\cos\theta + \frac{3}{4}\cos 3\theta \tag{1}$$

$$E = mc^2 \tag{2}$$

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Results 2

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Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table 1: Table caption

Nulla ut porttitor enim. Suspendisse venenatis dui eget eros gravida tempor. Mauris feugiat elit et augue placerat ultrices. Morbi accumsan enim nec tortor consectetur non commodo.

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
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Treatment 3	0.0009271	0.296

Table 2: Table caption

Results 1

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Figure 1: Figure caption

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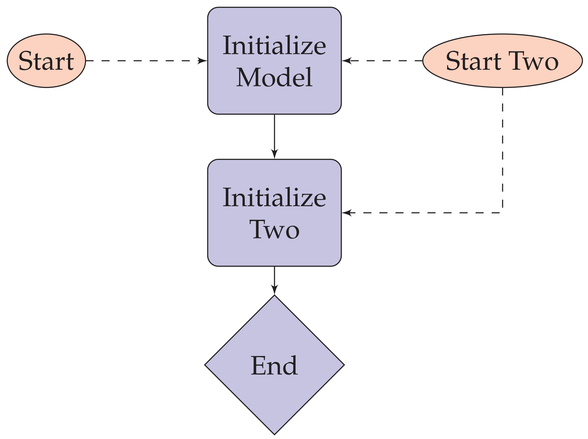
Figure 2: Figure caption

Conclusion



- Pellentesque eget orci eros. Fusce ultricies, tellus et pellentesque fringilla, ante massa luctus libero, quis tristique purus urna nec nibh. Phasellus fermentum rutrum elementum. Nam quis justo lectus.
- Vestibulum sem ante, hendrerit a gravida ac, blandit quis magna.
- Donec sem metus, facilisis at condimentum eget, vehicula ut massa. Morbi consequat, diam sed convallis tincidunt, arcu nunc.
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References

Future Research

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