Hi Guys,

Here is a summary of my results, please feel free to refer to any/all of these in your reports.

I have given an overview of the process of my analysis, and the primary result.

As we are to provide ‘evidence’ of our group collaboration, I have placed this document in the Github Repository to show my contribution to the Project, and will refer the Marker to this repository (this was the suggestion on Ed Discussion board). I hope that suits you guys.

Thanks for incorporating me into your group at late notice, it was a pleasure working with you.

Thank you,

Kara Joss

Joss Analysis

An initial H-R diagram of nearby point-like objects was produced to use as a benchmark. The distances to these objects were calculated from parallax measurements. Then, clusters of objects close in position to the two brightest X-ray Flashes were located, and H-R diagrams were produced for these clusters. To determine distance to each of these two clusters, parallax was first investigated, and where it was found to be inappropriate (too small), the main sequence fitting to the benchmark technique was used. X-ray Flashes were then treated as ‘standard candles’, and as such distances to all other X-ray sources were determined from the closest calibrating X-ray flash using the inverse square law.

In an analysis of the fuzzy objects (potential galaxies), the closest fuzzy object to each X-ray flash was found, and then assumed to have approximately the same distance as that X-ray flash. Each of these fuzzy objects also had radial velocity data. A plot was then made of distance versus radial velocity for these objects with a line of best fit applied to assess any distance-radial velocity relationship, and determine any possible ‘expansion rate’ of New Earth’s Universe.

Results

Main Sequence Fitting for X-Ray Clusters

Panel 2

Panel 1

Chart, scatter chart

Description automatically generatedChart, scatter chart

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Figure 6. X-ray Cluster H-R Diagrams Alongside Benchmark H-R Diagrams.

Panel 1 and 2 show the H-R diagrams for X-ray clusters 1 and 2 plotted alongside the H-R benchmark of nearby stars. It is clear that both X-ray clusters are much further away than the benchmark sample.

Panel 2

Panel 1

Chart, scatter chart

Description automatically generated Chart, scatter chart

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Figure 7. Main Sequence Fitting For Distance Determination.

Panels 1 and 2 show the main sequence fitted result allowing distance determination to be estimated. The fitted HR diagram for X-ray Flash 1 gives an offset of approximately 5.9-6.1, corresponding to a distance estimate of 10^(2.95 – 3.05) = 891–1122 parsecs. The fitted HR diagram for X-ray Flash 2 gives an offset of approximately 6.3 – 6.5, corresponding to a distance estimate of 10^(3.15 - 3.25) = 1413-1778 parsecs. As this fit is done by eye, it seems reasonable that the uncertainty in the distance measurement is approximately pc for Cluster 1 and 182 pc for Cluster 2. This corresponds to **distance estimates of 1006 115 parsecs for Cluster 1** and **1596 182 parsecs for Cluster 2.**

Distance-Radial Velocity Relationship

Figure 8. Distance-Radial Velocity Relationship.

There is a clear linear relationship between distance and radial velocity of an object from New Earth. The slope of this relationship as calculated by Excel is approximately **3711 kms-1Mpc-1**. We may consider this to be evidence of the theorized ‘expansion constant’.

Panel 2

Panel 1

Figure 9. Lower and Upper Limit of Expansion Constant from Distance Uncertainty.

Panel 1 provides an assessment of the expansion constant at the lower limit of distance estimates. Panel 2 provides an assessment of the expansion constant at the upper limit of distance estimates.

Results suggest there is a clear positive linear relationship between the distance and radial velocity of objects in our Universe (see Figures 8 and 9). An expansion constant of approximately **3711 kms-1Mpc-1** is determined from analysis of primarily X-ray data.