

# Erratum to “Data from Twenty-Three FRB’s Confirm the Universe Is Static and Not Expanding”, [Journal of High Energy Physics, Gravitation and Cosmology 2024, 10, 1152-1177]

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## Abstract

Dispersion measure in an FRB’s signal is produced by the photons of the radio waves interacting with the free electrons in the IGM. In New Tired Light (NTL), redshifts are produced by the photons of light interacting with these self-same electrons and so, one would expect a direct relationship between the DM of an FRB and the redshift of the host galaxy. However, workers in this field assume expansion and weight the DM by dividing it by the scale factor  $(1 + z)$  to allow for expansion. Once this weighting is removed, it was predicted back in 2016 (when the first FRB was localized) and later presented at a conference and published in the proceedings that, as more FRB’s were localized, a graph of DM versus  $\ln(1 + z)$  would be a straight line of gradient  $(m_e c / 2hr_e)$  or  $7.32 \times 10^{25} \text{ m}^{-2}$  in SI units. The original paper had twenty-four data points but this has risen significantly to sixty-four useable FRB’s and so this corrigendum updates that paper so that all sixty-four are used. The data give a straight-line graph of gradient  $7.12 \times 10^{25} \text{ m}^{-2}$ , a difference of 3% from  $(m_e c / 2hr_e)$  predicted nine years earlier.

## Keywords

Redshift, Dispersion Measure, Fast Radio Bursts, FRB’s, Tired Light, Static Universe, IGM

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## 1. Introduction to This Corrigendum

Whilst there are no corrections to the paper itself, since the publication of the

original paper [1] the number of localised FRB's has increased significantly from twenty-four to sixty-four [2] and this makes the results and conclusions much more robust. As a result, the original paper has been updated to include the new results.

## 2. NTL and a Static Universe

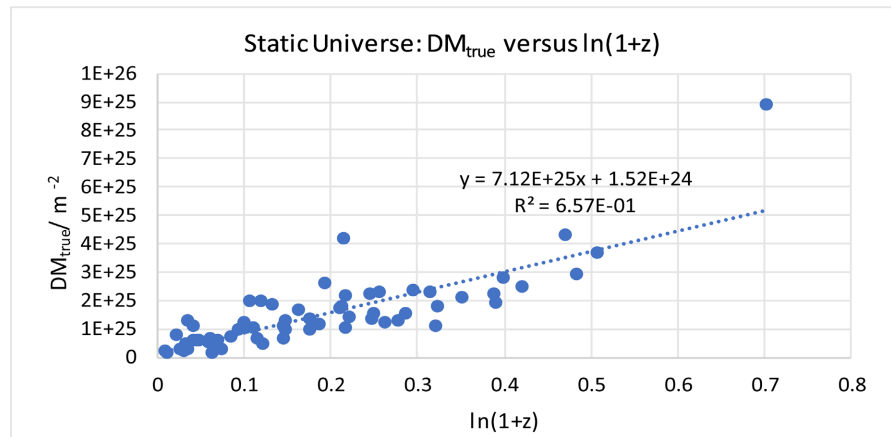
The predicted relationship between DM and  $\ln(1+z)$  [1] for a static universe where the weighting for "expansion" has been removed from the  $DM_{IGM}$  to give the "true" value",  $DM_{true}$ , is:

$$DM_{true} = (m_e c / 2hr_e) \ln(1+z) + DM_{host}$$

Or, in SI units:

$$DM_{true} = (7.32 \times 10^{25}) \ln(1+z) + DM_{host}$$

A graph of  $DM_{true}$  versus  $\ln(1+z)$  is predicted to be a straight line of gradient  $(m_e c / 2hr_e)$  or  $7.32 \times 10^{25} \text{ m}^{-2}$  (Figure 1).



**Figure 1.** Plot of  $DM_{true}$  versus  $\ln(1+z)$  for the 64 FRB's in a static universe. Note that the gradient is  $7.12 \times 10^{25} \text{ m}^{-2}$  compared with the NTL predicted value of  $7.32 \times 10^{25} \text{ m}^{-2}$  ( $m_e c / 2hr_e$ ), a difference of less than 3%. The intercept (mean host contribution to the DM) gives a value of  $1.52 \times 10^{24} \text{ m}^{-2}$  ( $49 \text{ pc}\cdot\text{cm}^{-3}$ ) in agreement with the 50 - 100  $\text{pc}\cdot\text{cm}^{-3}$  host galaxy contribution proposed by several workers in this field.

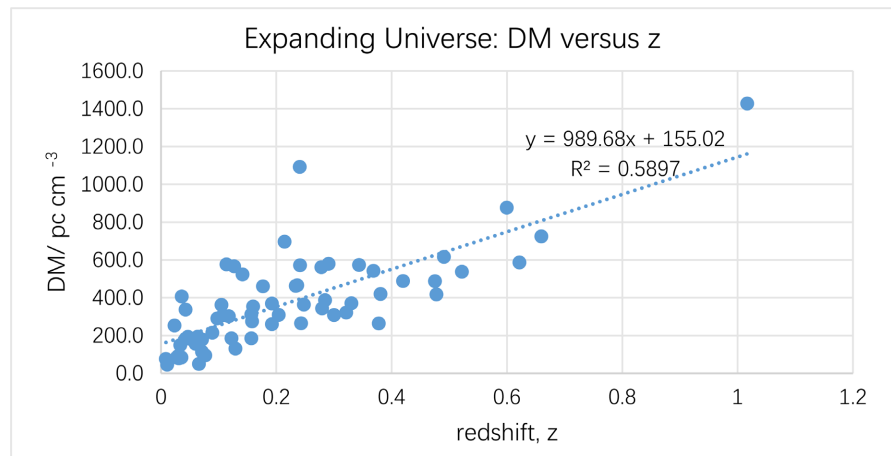
## 3. Macquart Relationship for an Expanding Universe

See Figure 2. The gradient of  $990 \text{ pc}\cdot\text{cm}^{-3}$  has a 16% difference to the predicted value of  $850 \text{ pc}\cdot\text{cm}^{-3}$ . The intercept of  $155 \text{ pc}\cdot\text{cm}^{-3}$  is higher than the 50 - 100  $\text{pc}\cdot\text{cm}^{-3}$  mean host galaxy contribution proposed by several workers in this field.

## 4. Conclusions

The extra data has improved the results for both an expanding and static universe.

However, with the weighting for expansion removed from the DM extragalactic to account for a static universe:



**Figure 2.** Plot of DM (weighted for expansion) versus  $z$  for the 64 FRB's to test the Macquart relationship ( $DM = 850z$ ).

- The gradient of the graph of  $DM_{true}$  versus  $\ln(1+z)$  is within 3% of the predicted gradient of  $(m_e c / 2hr_e)$ .
- The intercept is no longer “distorted” by the data from FRB 20220610A at a redshift of 1.017 which appears to have an unusually large host galaxy contribution to the DM.
- The mean host galaxy contribution (intercept) is in agreement with published values.
- There is better correlation between the data if the universe is taken to be static.

## Acknowledgements

The author thanks the workers in this field for their expertise in collecting such precise data without which this paper would not have been possible.

## Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

## References

- [1] Ashmore, L. (2024) Data from Twenty-Three FRB's Confirm the Universe Is Static and Not Expanding. *Journal of High Energy Physics, Gravitation and Cosmology*, **10**, 1152-1177. <https://doi.org/10.4236/jhepgc.2024.103070>
- [2] Surajit, S., Bhatporia, S. and Weltman, A. (2024) Fast Rado Bursts as Probes of the Late-Time Universe: A New Insight on the Hubble Tension. <https://arxiv.org/abs/2410.01974>