today.[8] Of course with Antarctica remaining stationary for all that 'time', the paleogeography and ocean currents would have been much different within the uniformitarian paradigm. Such a change in paleogeography may have retarded sedimentation, but again it may have enhanced it. Regardless, the researchers grab on to this different paleogeography to claim that the area remained in a low sedimentation area clear back to the Cretaceous.

It seems like the uniformitarian marine geologists require a lot of special conditions lasting for up to 85 Ma to account for the South Pacific Bare Zone. A more straightforward explanation within the Flood/post-Flood paradigm is that the area did not receive Flood sediments because of its long distance from landmasses. Very low sedimentation continued in the post-Flood periods due to all five factors above, and especially the fact that this part of the ocean has only existed for only about 4,500 years!

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WMAP 'proof' of big bang fails normal radiological standards

John Hartnett

Satellite maps of the big bang?

The WMAP (Wilkinson Microwave Anisotropy Probe) satellite[1] was launched with the intention of mapping the very small anisotropies (temperature fluctuations) in the cosmic microwave radiation (CMB) (figure 1). After the successful mission of the COBE (COsmic Background Explorer) satellite[2] George Smoot as team leader built WMAP for NASA and the data obtained resulted in him being awarded the Nobel prize in Physics last year.[3,4]

The anisotropies in the 2.7 K CMB temperature maps contain information regarding the radiation from the fireball 380,000 years after the alleged big bang, it is claimed. These very small (40 μK to 70 μK) anisotropies represent the monopole term of a spherical multipole expansion of the cleaned data. These were interpreted as the seeds for early galaxy formation. The dipole term was extracted, also giving a very smooth 2.7 K temperature but slightly different to the temperature determined from the monopole term. Nevertheless it was close to 2.7 K also. On the basis of the WMAP analysis, many papers have claimed evidence for details of the big bang theory, such as the amounts of alleged 'dark matter' and 'dark energy'.[5]

How well do the claims stack up?

However, this year, an expert in radiology published two papers[6,7] which prompted another[8] in the journal *Progress in Physics*[9] claiming that the analysis was flawed under standard radiological (analysis of radio waves) methodology. He argued that the maps contain no information of cosmological significance, certainly no information about the creation and history of the early universe.

WMAP was not equipped with an instrument that could measure the absolute intensity of any microwave signal it might encounter. Whereas COBE not only took a differential radiometer, it also took an absolute spectrometer—FIRAS. WMAP was only equipped with a differential radiometer, which could only measure the *differences* in the signals coming from any two parts of the sky. So the data can *never* specify the equivalent temperature of any particular region of the cosmos.

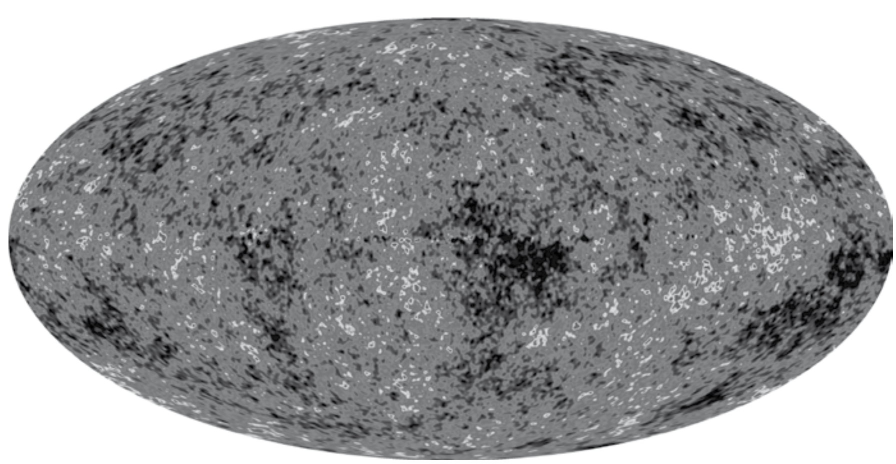

Figure 1. WMAP anisotropy map extracted from monopole component of the data. The dark and light spots represent small temperature variations.

Galactic foreground signal

To add to that, the signal was swamped by the thousand-times-stronger foreground signal from the Galaxy. To remove this massive signal, data was recorded in five frequency bands and in the analysis the sky was sliced up into different regions, which were differenced. Then the WMAP team utilized

> '… a linear combination of data in these bands, essentially adding and subtracting data until a null point is reached. In doing so, the WMAP team is invoking *a priori* knowledge which cannot be confirmed experimentally. Thus, the WMAP team makes the assumption that foreground contamination is frequency dependent, while the anisotropy is independent of frequency. This approach, however, is completely unsupported by the experimental data …'[10]

The authors contrasted this with standard NMR spectroscopy, where papers would be laughed at if they tried to take data in the region of a highly dominant contaminant signal. For example, in measuring the ^{1}H NMR spectrum of samples dissolved in water, the signal from the protons in water itself is huge. So it would be an exercise in futility to try to measure signals from the sample *around the same region*.

There are certainly techniques for removing this signal, but this means *manipulating the signal at the source*. Thus it is common to use heavy water that replaces protons with deuterons. But in the WMAP case, it is impossible to manipulate the source.

Linear combinations

The author shows that by taking different weighting factors in the linear combinations, a different null set, hence different maps of the universe, could be arrived at if the WMAP team had decided to emphasize a frequency band other than V band (61 GHz). Also, for the analysis of the one-year data set and the three-year data set different weights were chosen, but that is not consistent with the assumption that the sought-after cosmological parameters are stationary in the timescale of the cosmos. An altered set of such parameters is likely the result of different data processing. Moreover, the requirement that the signals of cosmological significance are frequency independent has never been proven.

The author also demonstrates that it is impossible to obtain a signal-to-noise (S/N) of much more than unity from the WMAP anisotropies. And from comparisons within his radiological experience, he shows that this is insufficient to obtain any useful information from the maps. E.g. clear maps of body parts obtained at higher resolution become amorphous blurs even at S/N ratios greater than WMAP (figure 2). Hence, the WMAP team is unable to confirm that the anisotropic 'signal' observed at any given point is not noise. He says,

> 'Therefore, any discussion relative to the cosmological significance of these results is premature.'[11]

He discusses from his own experience the problem of the formation of ghost images which result from the removal of powerful signals from weak signals. Because of the cleaning techniques used by the WMAP team it is highly likely that a significant portion of the maps contain spurious ghosts.

Difference maps

Possibly the most disturbing aspect of the discussion is that when the data were made available, only one-year and three-year averages were published. And the three-year data contains the one-year data. Why is that? Why not publish each successive year, so high resolution difference maps can be made. The WMAP team only published the difference map of their one- and three-year sets, with decreased resolution. Very fishy! Of course the intention is to show that that map doesn't change over time, but why the large pixels?

Robitaille also makes the point that the WMAP data has no depth information—it only has information at most of the direction of the source. He says the maps resemble the 2-dimensional X-ray images in medicine. Therefore, by their very nature, these maps are incapable of supporting any model of the universe other than a 2-dimensional flat model.

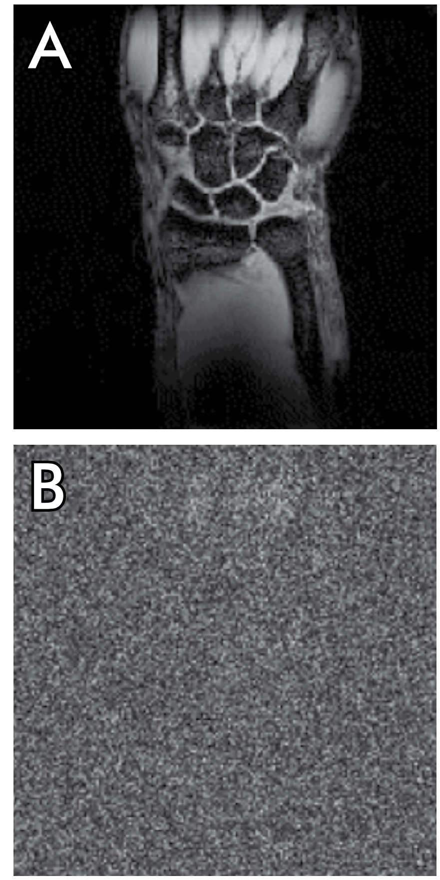

Figure 2. **(A)** Magnetic resonance image (MRI) of a human wrist acquired at 8 Tesla with a signal-to-noise (S/N) ratio of about 40/1. **(B)** The same MRI image as in (A) after the addition of random noise, resulting in a maximum S/N ratio of about 2.5/1. Clearly such low S/N impedes any sensible interpretation of the image. (From Robitaille[6]).

> 'In actuality, the WMAP team must overcome virtually every hurdle known to imaging: foreground contamination and powerful dynamic range issues, low signal to noise, poor contrast, limited sample knowledge, lack of reproducibility, and associated resolution issues. It is clear that the generation of a given anisotropy map depends strictly on the arbitrary weighting of component images. The WMAP team attempts to establish a "most likely" anisotropy map using mathematical tools, but they have no means of verifying the validity of the solution. Another team could

easily produce its own map and, though it may be entirely different, it would be equally valid.'[12]

Dipole term

The author however admits that there is something significant in the data:

'The only significant observations relative to this satellite are related to the existence of a dipole signal.'[12]

This confirms the findings of the NASA COBE satellite. Using the FIRAS instrument, COBE was able to determine a CMB monopole temperature as 2.730 ± 0.001 K and a dipole temperature of 2.717 ± 0.003 K.[13] These temperatures are not overlapping and the FIRAS instrument had tremendous signal to noise. Hence the difference between these numbers remains highly significant at the 99% significance level.

In short, only COBE was able to really measure the monopole temperature which the author claims can be attributed to specular reflection[14] off the earth's oceans.[7] COBE was placed in a 900-km Earth orbit. WMAP, on the other hand, was placed at the second Lagrange point 1.5 million km from Earth, and because it had no absolute instrument, it could not make a direct monopole measurement. Its DMR (Differential Microwave Radiometer) is only sensitive to the weaker dipole term. The meaning of the different temperature from the dipole term is that our solar system is moving through space, which is bathed in a weak emission of microwave radiation—source unknown.[8] And this is not the same source as the monopole term. Certainly after the future launch of the PLANCK satellite, which has both an absolute and a differential radiometer, any doubt can be resolved whether the monopole term comes from the earth or the cosmos.

Conclusion

Robitaille summarises his conclusions:

'The WMAP satellite also highlights that significant variability exists in the point sources and in the galactic foreground. Relative to the Universe, the findings imply isotropy over large scales, not anisotropy. *All of the cosmological constants which are presented by the WMAP team are devoid of true meaning, precisely because the images are so unreliable.* Given the tremendous dynamic range problems, the inability to remove the galactic foreground, the possibility of generating galactic ghosts through "cleaning", the lack of signal to noise, the lack of reproducibility, the use of coefficients which fluctuate on a yearly basis, and the problem of monitoring results on a cosmological timescale, attempts to determine cosmological constants from such data fall well outside the bounds of proper image interpretation [emphasis added].'[12]

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1. The WMAP satellite was developed by NASA Goddard. See <map.gsfc.nasa.gov/>.
2. The COBE satellite was developed by NASA Goddard to measure the diffuse infrared and microwave radiation from the early universe to the limits set by our astrophysical environment. It was launched November 18, 1989 and carried three instruments, a Diffuse Infrared Background Experiment (DIRBE) to search for the cosmic infrared background radiation, a Differential Microwave Radiometer (DMR) to map the cosmic radiation sensitively, and a Far Infrared Absolute Spectrophotometer (FIRAS) to compare the spectrum of the cosmic microwave background radiation with a precise blackbody. Each COBE instrument yielded a major cosmological discovery. See <lambda.gsfc.nasa.gov/product/cobe/>.
3. A dubious award—see Sarfati, J., Nobel Prize for alleged big bang proof, 7–8 Oct. 2006, <www.creationontheweb.com/content/view/4678>.
4. Ironically, just after this award, new discoveries show that the CMB can't be from the big bang because they don't cast the right shadows—see Hartnett, J., The big bang fails another test, *Journal of Creation* **20**(3):15–16, 2006.
5. There is a not-so-subtle connection here with a need to support the ruling paradigm. The relative proportions of these exotic mass/energies that supposedly contribute to the state of the universe are needed such that the standard Friedmann model is not excluded. In short there is an *a priori* reason to want to believe the WMAP contains real information.
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7. Robitaille, P-M, On the origins of the CMB: Insight from the COBE, WMAP, and Relikt-1 satellites, *Progress in Physics* **1**:19–23, Jan. 2007.
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9. This journal is not a first ranked journal but a web-based online-only journal. So some caution should be exercised as to the findings mentioned here. Nevertheless the research presented by the author seems reasonable, and he is an expert in the area of radiological data analysis. The main reason he could not publish in higher ranked journals is likely because of the controversial nature of the argument—overturning a recent Nobel award. However with the launch of the PLANCK satellite, the thesis can be tested.
10. Robitaille, ref. 6, pp. 6–7.
11. Robitaille, ref. 6, p. 8.
12. Robitaille, ref. 6, p. 15.
13. The monopole and dipole terms are the first and second terms of a multipole expansion. A multipole expansion is a series expansion of the effect produced by a given system in terms of an expansion parameter which becomes small as the distance away from the system increases.
14. Specular reflection means scattering from the surface of the ocean in this case. Some wavelengths are absorbed and some reflected.