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Magnetism: Further Proof of Wave Particle Duality

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Abstract

The question of what magnetism is vital to quantum physics. We know what all other quantum phenomenon is, but we did not know what magnetism is. It is not enough to say it is a force because of a charge. That force must be something, for consistencies sake it had to be tested. This paper was written in order to confirm the results that were received in the experiments that took place that led to the paper "Magnetism: Insights from the Thomas Young Experiment" where it was concluded the magnetic phenomenon is both a particle and a wave. Will different interference patterns confirm a khumalon and wave like behaviour? The khumalon is the name of the particle associated with magnetic phenomenon. This paper concludes by confirming what was discovered in mentioned paper. Magnetism organizes into a wave no matter the interference. Understanding this reality, it allows us to understand what is happening with simple magnetic interactions. When like poles meet because they can not occupy the same space they push each other. Opposite poles are antiparticles to each other and annihilate each other. South pole scientifically speaking is not attracted to the north pole, the reason why the magnets slam each other is because they are closing a magnetic vacuum caused by the particles annihilating each other. We can now start theorizing on why a lodestone attracts iron because we now know we are dealing with a particle.

Keywords

Anti-Matter, Experiment, Heisenberg Principle, Khumalon, Magnetism, Matter, Quantum Magnetism, Wave/Particle Duality, Symmetry

1. Introduction

This paper is a follow up to the paper "Magnetism: Insights from the Thomas Young Experiment [1]" where it was concluded that the magnetic phenomenon shows both characteristics of a particle and a wave.

This is experimental in nature and involves the same techniques as those used in the above-mentioned paper, the only difference being the pattern of the material that is used to cause interference. All the data is available on [2] figshare.com. The magnetic phenomenon is traveling, not much really interferes with it, like neutrinos. However, materials like iron do interfere with this phenomenon, and thus we must use such material to cause an interference and observe how the magnetic phenomenon behaves.

Always more proof is better than less proof. Proof is something that can not reasonably be explained by any other means.

The experiment takes the idea of Thomas Youngs's double slit experiment only in a way magnetism can, because magnetism has a relationship with what is causing the interference patterns, the iron slabs in front of it. This means you can use slits or slabs.

The paper strictly builds up on the experiments that led to the paper "Magnetism: Insights from the Thomas Young Experiment". There was no experiment before the paper to determine the nature of magnetism as a quantum phenomenon. That paper was the discovery of the quantum nature of magnetism.

Confirming what magnetism is means confirming it organizing into a wave. This brings new insight into the wave particle nature of quantum phenomenon. It supports but does not confirm the view of such minds as [3], Gullapalliwho argues that "This ground-breaking result does not contradict Bohr's Complementarity Principle, it makes it unnecessary. The important consequence is that there is no mysterious change from particle to wave and vice versa, which Richard Feynman had called the "only mystery" of quantum mechanics." Magnetism organizing into a wave would support this view. It is particles organizing themselves into a wave formation as it is the most efficient way for them to travel. It is not instantaneous the formation of the magnetic wave, it takes 2 jiffies. A jiffy is how long light takes to travel I centimeter.

Confirming what magnetism is and understanding its relationship with charged particles, we can say for charged particles at the least, we can know their velocity by tracking their magnetic trail, never touching them, putting in doubt the Heisenberg Principle. If we can track the magnetic trail of an electron, we can know its velocity. We can generalize and say anything that emits anything can be tracked without being disturbed.

Confirming the nature of magnetism, that it organizes into a wave and thus a particle allows us to delve into the nature of the universe. Being a particle, magnetism comes in "pairs", and one is antimatter of the other. Where is all the antimatter? Could it be on the other side of "big bang" just like a magnet, one side is matter, another is anti matter. Magnetism demonstrates a good account of tending towards symmetry.

2. Aims

The aims of this experiment are to further see the magnetic phenomenon and using data determine what it is, unknown, wave, or particle. It is not unknown, it is both a wave and a particle, but can this fact be proven further.

Using different configurations of the same quality of metal as used in the experiments that led to the above mentioned paper, how does the magnetic phenomenon behave, is it still a wave and a particle, a magnetic wave and a khumalon, the name of the magnetic particle.

3. The Experiment

The experiment involved a variation on the Thomas Young Experiment given the more knowledge that we had on the magnetic phenomenon because of the paper mentioned above. Instead of slits, we would use two metal slabs, the same size as the slits at 3 cm apart and 1 cm apart as illustrated in **Figures 1-3**.

The experiments where carried out at the Laboratory run by Hathaway Research International in Mississauga, Ontario, Canada in the months of October and November 2020. The Laboratory space was paid out of pocket.

All experiments involve measuring across the face of the slabs, not away from the slabs.

Figure 1(b) represents a two-dimensional representation of **Figure 1**. There are 4 lines in front of the cut-out slabs. Original [1] experiments involved a slab with metal slits. Line a represents 0.5 cm from the slabs. Line b represents 1 cm from the slabs. Line c represents 2.5 cm from the slabs, and line d represents 5 cm from the slabs. Across each line, millimetre by millimetre 73 - 74 measurements are taken. A special tool had to be invented to allow the gauss meter to take a measurement every millimeter. Reality is it can take measurements as fine as every 0.01 mm, but the experiment would have been too exhaustive physically. Theoretically with automation instead of a human controlling the instrument, the measurements could be even finer.

3.1. Experiment 1

Experiment 1 involved the set up in **Figure 1** with the iron slabs 3 cm apart. There was the magnet placed 20 mm behind in the center separated by a wooden magnetic block so that the magnet never touches the iron slabs.

The results for experiment 1 can be viewed in **Table A1** in the appendix section. **Figure 4** shows the results in illustration, graphically.

The interference pattern we received must just be accepted, that is what was measured. We can see at the face there are all sorts of distortions. One can pick up 3 wave formations. As illustrated in **Figure 5**, clearly marked A, B, and C. A and C being associated with the iron slabs, and B the space in between which is the magnetic phenomenon that has not been used to magnetize the slabs. Never forget we are dealing with interference and understanding the results of that interference.

In the paper, "Magnetism: Insights from the Thomas Young Experiment [1]", it was concluded that by at least 2 cm of travel, 2 jiffies of a second the phenomenon becomes a wave. It organizes itself, meaning it is discrete and takes a

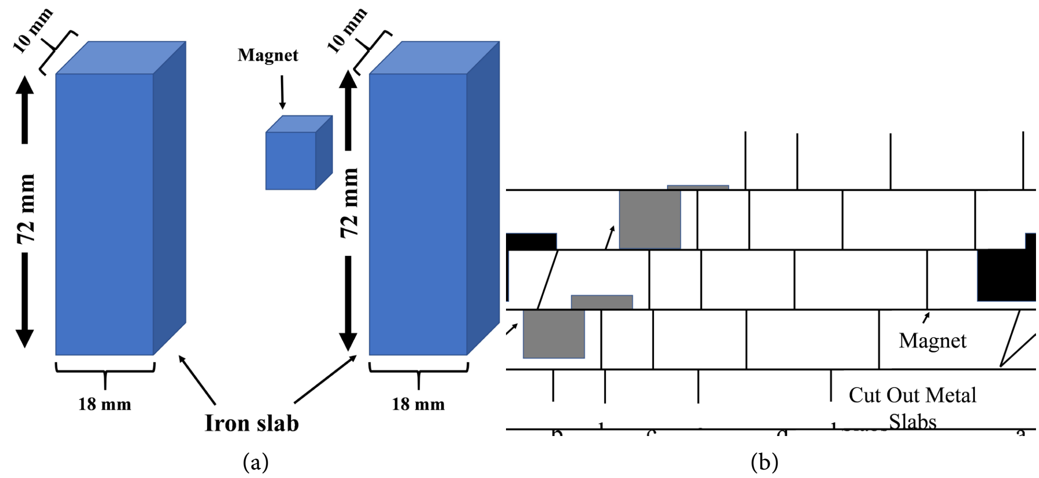

Figure 1. (a) Experiments 1 and 2, Iron Slabs, 3 and 1 cm apart; (b) Experimental set up with cut outs.

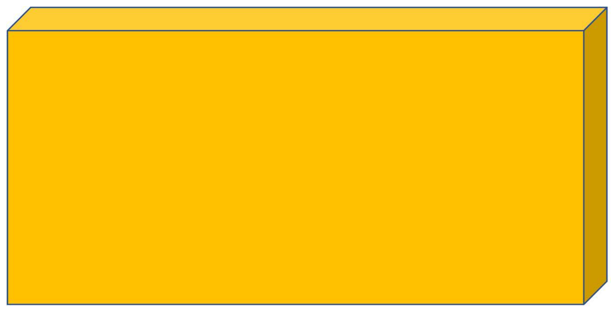

Figure 2. Iron Slab 60 × 40 × 4 mm.

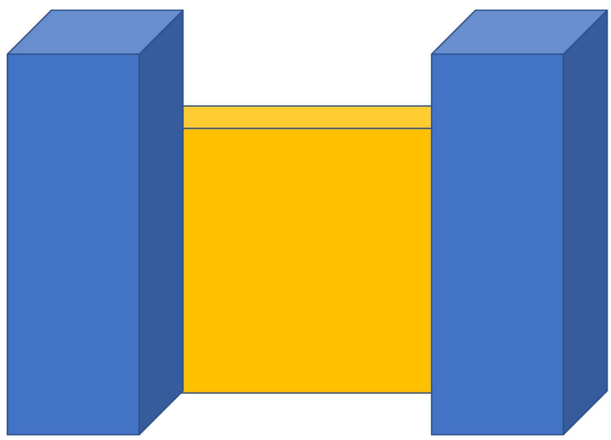

Figure 3. Experiment 3, Iron Slabs 3 cm apart on Iron Slab.

wave formation. The reason for this wave formation can only be that it is traveling through a medium and that is the most efficient way to travel through this medium, only because the magnetic phenomenon organizes itself.

In experiment 1, by 1 cm, 1 jiffy of a second the phenomenon has organized itself into a wave as can be seen from Figure 6. From the disorganization of Figure 5, the phenomenon organizes itself into a wave. Not only does it organize itself into a wave, when we look at Figure 4, and looking at Table A1, at 50 cm

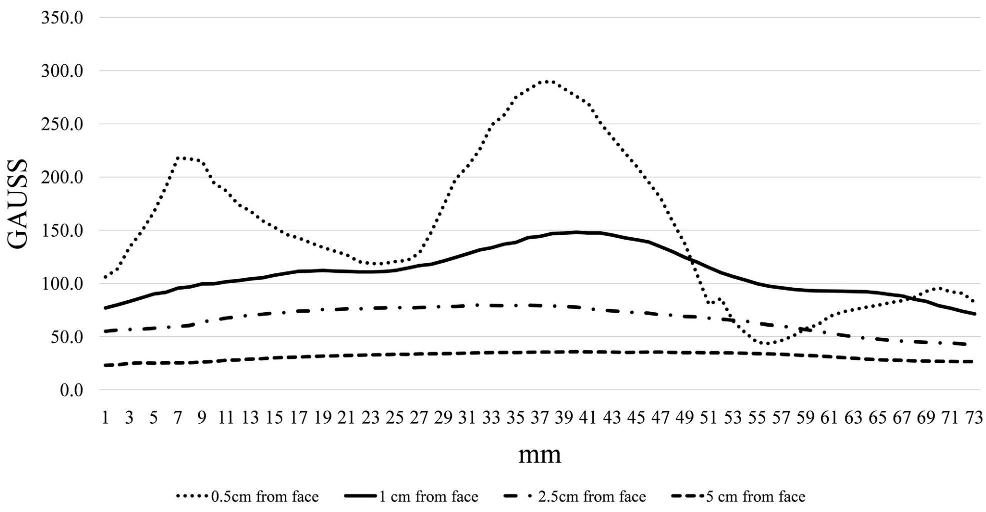

Figure 4. Iron slabs 3 cm Apart.

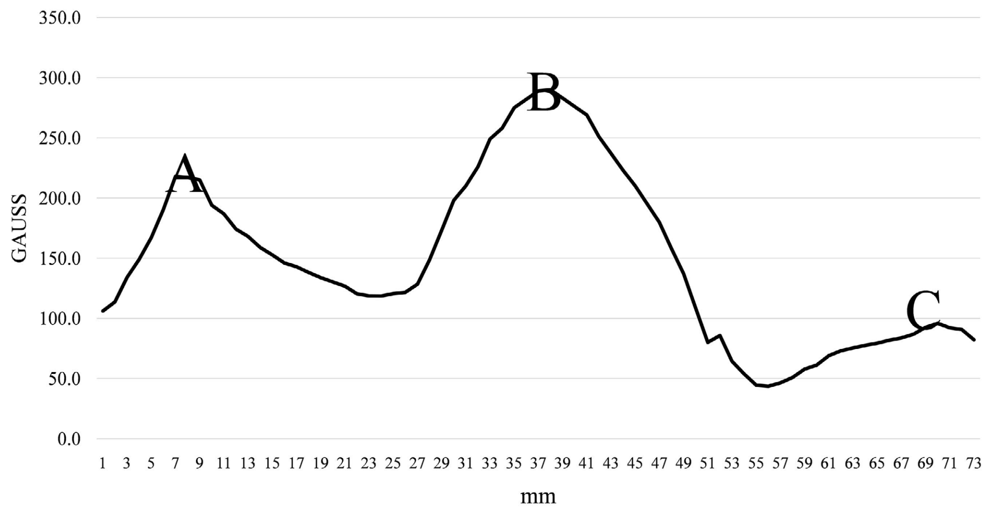

Figure 5. 0.5 cm from face slabs 3 cm apart.

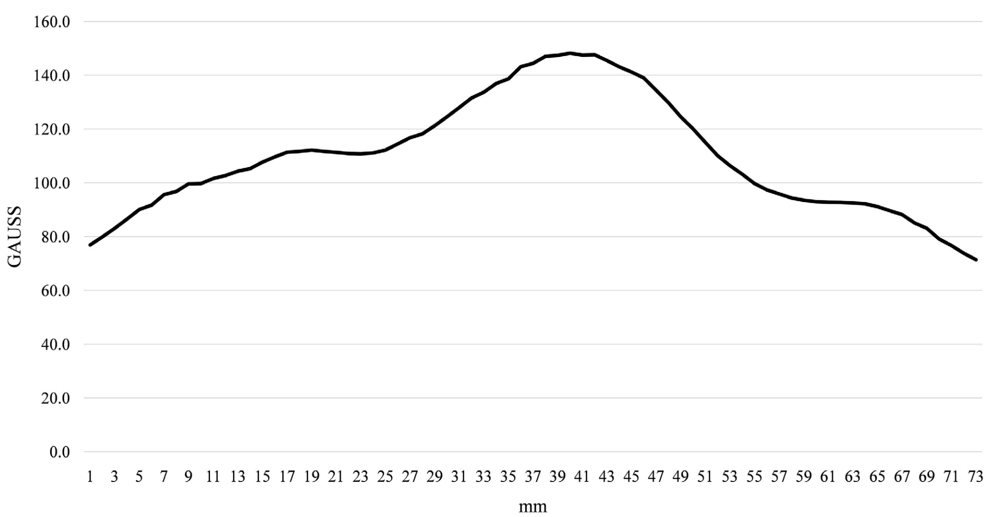

Figure 6. 1 cm from face slabs 3 cm apart.

to 67 mm, there is more of this phenomenon at 1 cm than at 0.5 cm. Between 53 mm and 58 mm even at 2.5 cm from face there is more of this material. This is further evidence that confirms the phenomenon organizes itself into a wave, as clearly from 1 cm, to 5 cm and beyond it is a wave.

Observing the magnet allows us to see what is happening in jiffies of a second. The khumalon, the discrete magnetic phenomenon, organizes itself into a wave, but it takes time, in this case in a jiffy of a second.

3.2. Experiment 2

This experiment involved the set up as in experiment 1 the difference being the iron slabs are 1 cm apart instead of 3 cm apart. The results for the experiment can be viewed in **Table A2** and are illustrated below.

As can be seen in **Figure 7**, at 0.5 cm/near face and at 1 cm the pattern of the magnetic phenomenon is not yet a wave. Between 44 mm and 51 mm, there is more of the magnetic phenomenon at 1 cm away from the face than at 0.5 cm. Again, it is a particle, a khumalon and it organizes itself, or for it to be higher 1 cm away than at 0.5 cm in this case, the phenomenon would have to travel faster than the rest of the phenomenon, faster than the speed of light, or, it organises itself to move best in the medium that it will be travelling in, why else would it organise itself in such a manner.

It is clearly a wave at 2.5 cm. **Figure 8** shows that at 1 cm when the slabs are 3 cm apart there is a wave formation but when the slabs are 1 cm apart it does not have that classic wave formation we see the two humps and a dip in the middle.

3.3. Experiment 3

Experiment three was done because of the awkward figures that came out of experiment 1. It was felt very unusual, even though one should just accept the result, but it is unusual for the phenomenon at any time to be higher at 1 cm than at 0.5 cm, the implications. Thus, the first experiment was reimagined with a solid block behind the two-separate slabs.

The reasoning being that the solid block would hopefully balance out the magnetic field between the two slabs. And as can be seen from **Figure 9** that is exactly what happened. Being 18 mm wide, it means at 3 cm apart each slab had an overhang of 3 mm. However, this did not remove the peculiarity of that between 30 - 46 mm there is more of the magnetic phenomenon at 1 cm than at 0.5 cm, around the middle (**Table A3**).

At 2.5 cm and 5 cm and beyond, always phenomenon has a wave like formation, fitting very nicely into Schrodinger's equation type definition.

4. Always a Wave

The phenomenon after interference shows particle behaviour, something discrete that organizes itself into a wave. As phenomenon travels at the speed of light, it means within 2 jiffies it has a wave formation, no matter the interference.

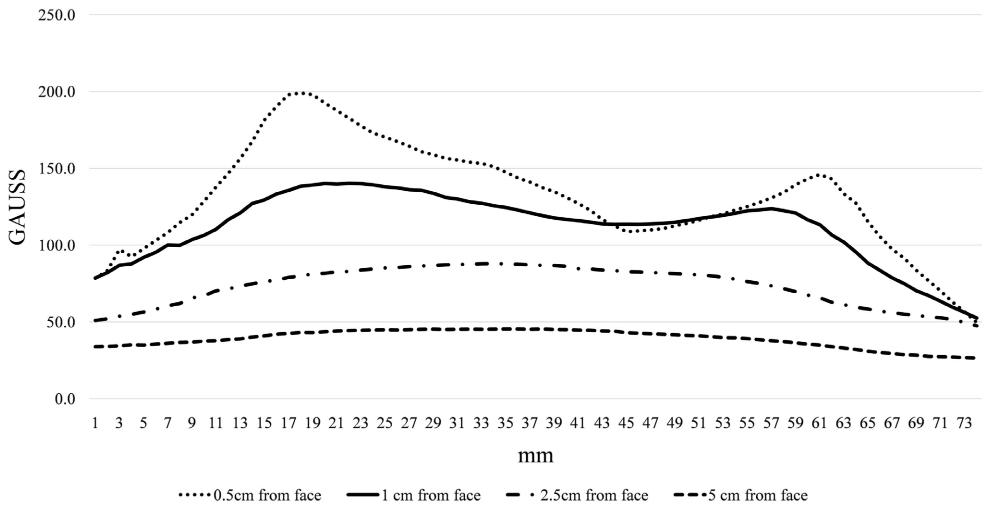

Figure 7. Iron slabs 1 cm apart.

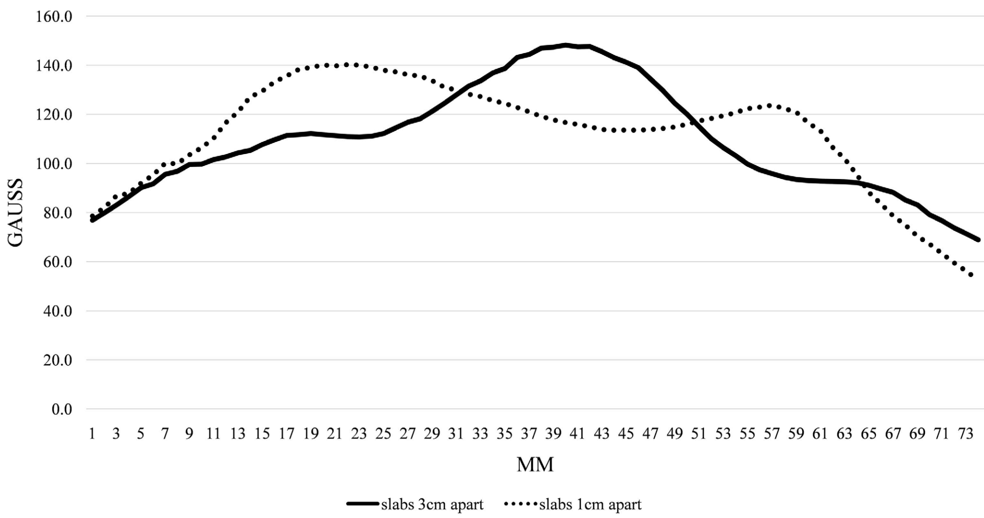

Figure 8. Comparing wave pattern at 1 cm.

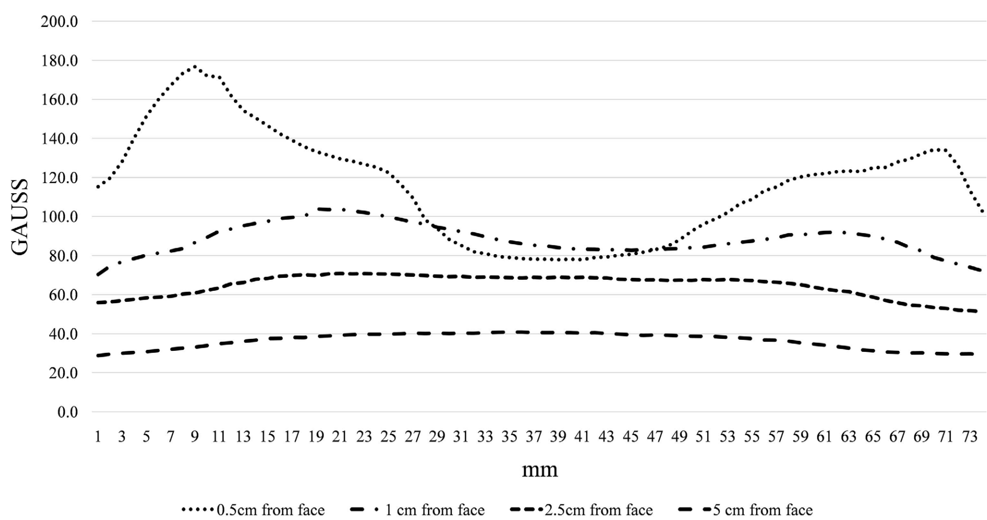

Figure 9. Metal slabs 3 cm apart on metal slab.

Figure 10 and Figure 11 show the behaviour of the phenomenon after 2.5 and 5 cm, respectively.

Though we always get a wave and with equipment available for this experiment a gauss meter, no matter how detailed it only will ever confirm magnetism organizing into a wave. This does not refute the concept of [4] wave particle duality. It however suggests the reason for the wave is most efficient way to travel. This idea of being most efficient way to travel does not seem to rest only with particles but also with [5] molecules.

For magnetism to contribute to the wave particle duality at the particle level we must look at the magnetic moment of charged particles like the electron. Then we measure that magnetic moment as it moves away from the electron, only then will we know if a singular khumalon moves as a wave. A yes does not necessarily mean confusion around concept of wave particle duality. All it means is just that individual particles take the wave shape to travel efficiently the concept of the discreteness of a particle is not challenged. We know for example that electrons exhibit wave particle duality, but we also know they are almost perfectly [6] round, it is movement through a medium that desires this wave formation.

5. Understanding the Process

What is happening in terms of the language of symbols. This paper has moved forward in time since the original experiments in the paper Magnetism: Insights from the Thomas Young Experiment.

There is an interference pattern IP at the face. This interference pattern is transformed to a wave function Wm. The interference patterns can be numerous. In the experiments regarding this paper we used magnetic slabs, and depending on the distance apart the slabs are, we can get thousands of different interference patterns. In the original experiments, slits were used to create the interference pattern, again the interference pattern varies according to the distance between the slits. The interference pattern can thus be described as IP_i.

Each interference pattern will need a unique transformative function in mathematical terms to get to the wave function Wm. The transformative function can be described as WT_i.

The process can thus be understood mathematically as:

$$IP_i WT_i \rightarrow Wm \quad (1)$$

where → denotes leads to. Using leads to instead of equals is more sensible, as technicaly speaking that is what is happening.

To use the concept of equals requires more dynamic model:

$$IP_i WT_{it} = Wm_t \quad (2)$$

where WT_{it} is the transformative function at time t and Wm_t is the wave function at time t. $t < 2$ jiffies.

Equation (1) becomes Equation (3) after 2 jiffies, at $t \geq 2$ jiffies.

$$IP_i WT_i = Wm \quad (3)$$

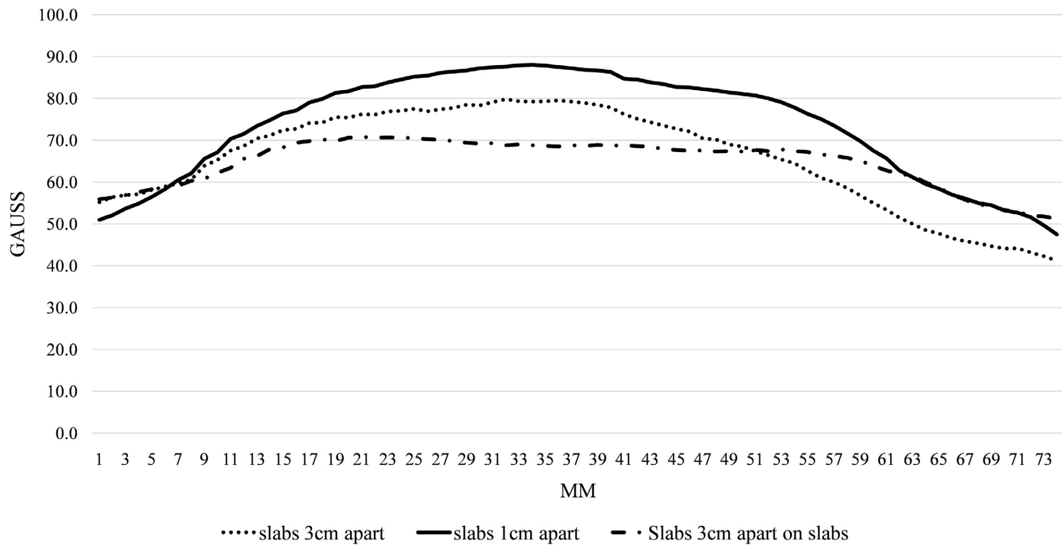

Figure 10. 2.5 cm from face.

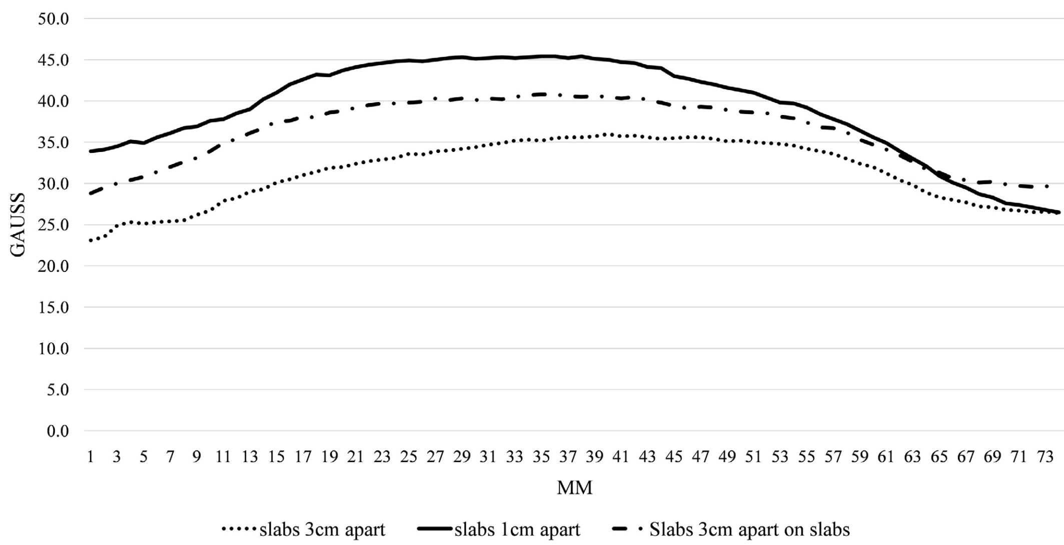

Figure 11. 5 cm from face.

6. Conclusions

This paper confirms what was observed in the paper "Magnetism: Insights from the Thomas Young Experiment [1]" for the same reasons. One can see with the interference the phenomenon behaves differently the further away one moves. This is because the phenomenon organizes itself into a wave. It was confirmed in a more dramatic fashion because of the nature of the interference we could see at some parts, at 0.5 cm it was lower than at 1 cm meaning the phenomenon has to organize itself, how else can it fill those gaps?

The justification for the above paragraph is that, just as in the original experiments, we see the magnetic phenomenon organize itself into a wave such that Equations (1) - (3) above are true for the first batch of experiments as well as this paper. In both batches of experiments the wave is seen at $t \geq 2$ jiffies. The only difference was in first batch of experiments slits were used to create interference pattern instead of slabs.

By taking this wave formation, it has to, it can only mean it interacts with this medium it is going through, all quantum phenomenon does, that is why it organizes into a wave.

As so much of this stuff disappears so quickly, there is only possible explanation it is highly unstable. With 2 - 5 jiffies 90% of this phenomenon has disappeared. Thus, the magnetic phenomenon allows us to both understand the stable quantum material like photons, neutrinos, and electrons, as well as highly unstable material that disappears in jiffies of a second in colliders.

These experiments once again go to show the reality of [7] knowledge, that we can only know what is discrete, and everything is in a relationship. Not forgetting the original law that led us to understand that everything is in a relationship, the law of consistency [8]. The magnetic phenomenon must be consistent with all other phenomena at the basic levels.

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Conflicts of Interest

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

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Appendix

Table A1. Ironr slabs 72 × 18 × 10 mm 3 cm apart.

All readings in Gauss				
mm left to right	0.5 cm from face	1 cm from face	2.5 cm from face	5 cm from face
1	106.1	76.9	55.2	23.1
2	113.7	79.9	56.4	23.5
3	134.1	83.1	56.9	24.9
4	149.0	86.5	57.1	25.3
5	167.1	90.1	58.1	25.1
6	190.4	91.7	58.9	25.3
7	218.0	95.6	59.7	25.4
8	217.0	96.8	60.6	25.5
9	215.0	99.6	63.9	26.2
10	194.0	99.7	65.3	26.7
11	186.9	101.6	67.5	27.9
12	174.2	102.7	68.6	28.2
13	168.1	104.3	70.4	29.0
14	159.0	105.3	71.1	29.3
15	152.8	107.7	72.4	30.1
16	146.0	109.6	72.7	30.5
17	142.9	111.4	74.1	31.0
18	138.2	111.7	74.2	31.4
19	133.9	112.2	75.5	31.9
20	130.3	111.7	75.4	32.0
21	126.8	111.3	76.2	32.4
22	120.5	110.9	76.1	32.7
23	118.7	110.8	76.9	32.9
24	118.6	111.1	77.0	33.1
25	120.6	112.2	77.5	33.6
26	121.7	114.5	76.9	33.5
27	128.4	116.8	77.4	33.9
28	148.6	118.2	77.7	34.0
29	173.0	121.2	78.5	34.2
30	198.0	124.5	78.3	34.4
31	210.0	128.0	79.1	34.7
32	226.0	131.5	79.8	34.9
33	249.0	133.7	79.3	35.2
34	258.0	136.9	79.2	35.3

Continued

35	275.0	138.7	79.3	35.2
36	282.0	143.2	79.5	35.5
37	289.0	144.4	79.2	35.6
38	290.0	147.0	78.9	35.6
39	283.0	147.4	78.4	35.7
40	276.0	148.2	77.8	36.0
41	269.0	147.5	76.2	35.7
42	251.0	147.6	75.1	35.8
43	237.0	145.5	74.3	35.6
44	223.0	143.1	73.5	35.4
45	210.0	141.2	72.7	35.5
46	195.0	139.0	72.1	35.6
47	179.9	134.4	70.4	35.6
48	157.9	129.8	70.2	35.4
49	137.2	124.5	69.0	35.1
50	108.3	120.1	68.5	35.2
51	80.1	115.0	67.4	35.0
52	85.8	110.1	66.4	34.9
53	64.4	106.4	65.4	34.8
54	53.8	103.2	64.5	34.6
55	44.5	99.7	62.7	34.2
56	43.6	97.4	61.0	33.9
57	46.4	95.9	60.0	33.6
58	50.9	94.4	58.6	33.0
59	57.8	93.5	56.8	32.4
60	61.2	93.0	55.0	32.0
61	69.0	92.8	53.4	31.2
62	73.1	92.7	51.5	30.4
63	75.4	92.5	50.0	29.8
64	77.6	92.2	48.5	28.9
65	79.4	91.1	47.7	28.3
66	81.8	89.6	46.6	28.0
67	83.7	88.2	45.9	27.7
68	86.9	85.1	45.4	27.2
69	92.5	83.1	44.7	27.1
70	95.9	79.1	44.1	26.8
71	92.2	76.7	44.2	26.7
72	90.7	73.8	43.2	26.5
73	82.2	71.4	42.3	26.6

Table A2. Ironr slabs 72 × 18 × 10 mm 1 cm apart.

All readings in Gauss				
mm left to right	0.5 cm from face	1 cm from face	2.5 cm from face	5 cm from face
1	78.4	78.6	51.0	33.9
2	83.5	82.1	52.1	34.1
3	97.2	86.9	53.7	34.5
4	92.5	87.8	54.9	35.1
5	97.7	92.0	56.5	34.9
6	103.0	95.3	58.3	35.6
7	108.2	100.1	60.5	36.1
8	114.8	99.9	62.1	36.7
9	119.7	103.5	65.6	36.9
10	128.6	106.4	67.1	37.6
11	137.9	110.3	70.3	37.8
12	146.7	116.6	71.5	38.5
13	156.4	121.0	73.4	39.0
14	167.5	127.1	74.8	40.2
15	181.4	129.4	76.4	41.0
16	190.3	133.2	77.1	42.0
17	198.0	135.6	79.0	42.6
18	199.0	138.3	79.9	43.2
19	198.0	139.1	81.3	43.1
20	192.5	140.1	81.7	43.7
21	187.6	139.7	82.7	44.1
22	182.7	140.2	82.9	44.4
23	177.6	140.0	83.8	44.6
24	173.0	139.2	84.5	44.8
25	170.3	137.9	85.2	44.9
26	167.5	137.3	85.4	44.8
27	164.4	136.1	86.1	45.0
28	160.8	135.6	86.4	45.2
29	158.9	133.7	86.7	45.3
30	156.6	131.0	87.2	45.1
31	155.4	129.9	87.4	45.2
32	154.0	128.2	87.6	45.3
33	153.2	127.2	87.9	45.2
34	151.1	125.6	88.0	45.3
35	147.5	124.4	87.8	45.4

Continued

36	143.7	122.8	87.5	45.4
37	141.1	121.0	87.2	45.2
38	137.5	119.2	86.8	45.4
39	134.8	117.7	86.7	45.1
40	131.1	116.7	86.3	45.0
41	127.1	115.9	84.7	44.7
42	122.7	114.9	84.5	44.6
43	116.6	113.8	83.8	44.1
44	112.6	113.5	83.4	44.0
45	108.7	113.6	82.7	43.0
46	109.3	113.5	82.6	42.7
47	109.9	113.8	82.2	42.3
48	110.7	114.2	81.9	42.0
49	112.6	114.8	81.4	41.6
50	114.1	116.0	81.1	41.3
51	116.2	117.3	80.7	41.0
52	118.5	118.3	80.0	40.4
53	120.4	119.4	79.1	39.8
54	122.9	120.7	77.8	39.7
55	125.1	122.3	76.3	39.2
56	127.8	122.9	75.1	38.4
57	130.8	123.7	73.5	37.8
58	134.2	122.4	71.7	37.2
59	139.3	120.9	69.8	36.4
60	143.2	116.5	67.5	35.6
61	145.9	113.3	65.7	34.9
62	143.1	106.6	62.8	33.9
63	133.4	101.9	61.2	33.0
64	127.2	95.4	59.5	32.1
65	115.2	88.2	58.4	30.9
66	105.4	83.5	57.0	30.1
67	97.4	78.6	56.1	29.5
68	91.4	74.9	55.0	28.7
69	83.6	70.3	54.5	28.3
70	76.9	67.2	53.2	27.6
71	70.2	63.4	52.7	27.4
72	62.9	59.6	51.6	27.1
73	56.6	56.2	49.7	26.8
74	49.7	52.5	47.5	26.5

Table A3. Ironr slabs 72 × 18 × 10 mm 3 cm apart with iron sheet.

All readings in Gauss				
mm left to right	0.5 cm from face	1 cm from face	2.5 cm from face	5 cm from face
1	115.2	70.3	55.9	28.8
2	119.8	74.7	56.3	29.5
3	128.3	76.8	56.9	30.0
4	140.5	78.5	57.6	30.4
5	151.5	80.2	58.3	30.8
6	160.1	81.3	58.7	31.4
7	167.2	82.3	59.1	32.0
8	173.4	83.6	60.3	32.6
9	176.7	86.7	60.8	33.1
10	171.9	89.4	62.2	33.9
11	171.5	92.5	63.4	34.9
12	161.7	93.6	65.6	35.4
13	154.2	95.3	66.2	36.1
14	150.5	96.5	67.9	36.7
15	146.5	97.6	68.3	37.5
16	142.4	99.0	69.4	37.6
17	139.1	99.6	69.8	38.1
18	135.8	100.0	70.2	38.0
19	133.2	103.9	69.8	38.6
20	131.4	103.5	70.6	38.8
21	129.5	103.7	70.8	39.2
22	128.3	102.9	70.6	39.5
23	126.7	102.1	70.7	39.7
24	125.1	101.0	70.6	39.7
25	122.4	99.9	70.5	39.8
26	116.3	98.5	70.3	39.9
27	109.4	97.1	70.1	40.3
28	98.3	96.1	69.8	40.1
29	93.8	94.5	69.4	40.3
30	88.2	93.5	69.2	40.1
31	85.1	92.2	69.3	40.3
32	81.9	91.1	68.8	40.2
33	80.9	89.6	69.0	40.5
34	79.5	88.2	68.8	40.7
35	79.0	87.0	68.7	40.8

Continued

36	78.4	86.1	68.5	40.8
37	78.1	85.3	68.8	40.6
38	78.1	84.9	68.6	40.5
39	77.9	84.1	68.9	40.6
40	78.1	83.5	68.7	40.5
41	77.9	83.3	68.8	40.3
42	79.0	83.2	68.6	40.5
43	79.3	82.9	68.5	40.1
44	80.1	83.1	67.9	39.8
45	80.6	82.7	67.7	39.4
46	81.7	83.0	67.5	39.1
47	83.0	82.9	67.6	39.3
48	84.7	83.4	67.3	39.2
49	88.0	83.6	67.4	38.9
50	92.5	84.1	67.3	38.7
51	96.2	84.3	67.7	38.6
52	98.9	85.3	67.4	38.5
53	102.1	86.1	67.8	38.1
54	106.6	86.8	67.4	37.9
55	108.8	87.5	67.2	37.4
56	113.2	88.3	66.6	36.8
57	115.1	89.1	66.3	36.7
58	118.5	90.6	65.8	36.2
59	120.2	90.7	65.1	35.3
60	121.4	91.2	63.9	34.7
61	122.0	91.8	62.8	34.1
62	122.9	92.0	62.0	33.4
63	123.3	91.6	61.5	32.6
64	123.0	90.8	59.9	31.7
65	125.0	89.9	58.7	31.3
66	125.1	88.5	57.0	30.6
67	127.9	86.8	55.8	30.4
68	129.4	84.1	54.6	30.1
69	132.2	82.4	54.3	30.2
70	134.2	79.0	53.3	29.9
71	133.9	77.3	52.9	29.7
72	125.9	75.6	52.0	29.6
73	113.0	74.0	51.8	29.7
74	102.6	72.2	51.2	29.2