

Don't want to hear anymore about ferrocell not showing the flux of magnetic fields!

Magnetic field of coil (copper no ferromagnetic no ferromagnetic core was used in the coil) using fine iron powder Fe (44 microns) suspended in mineral oil.

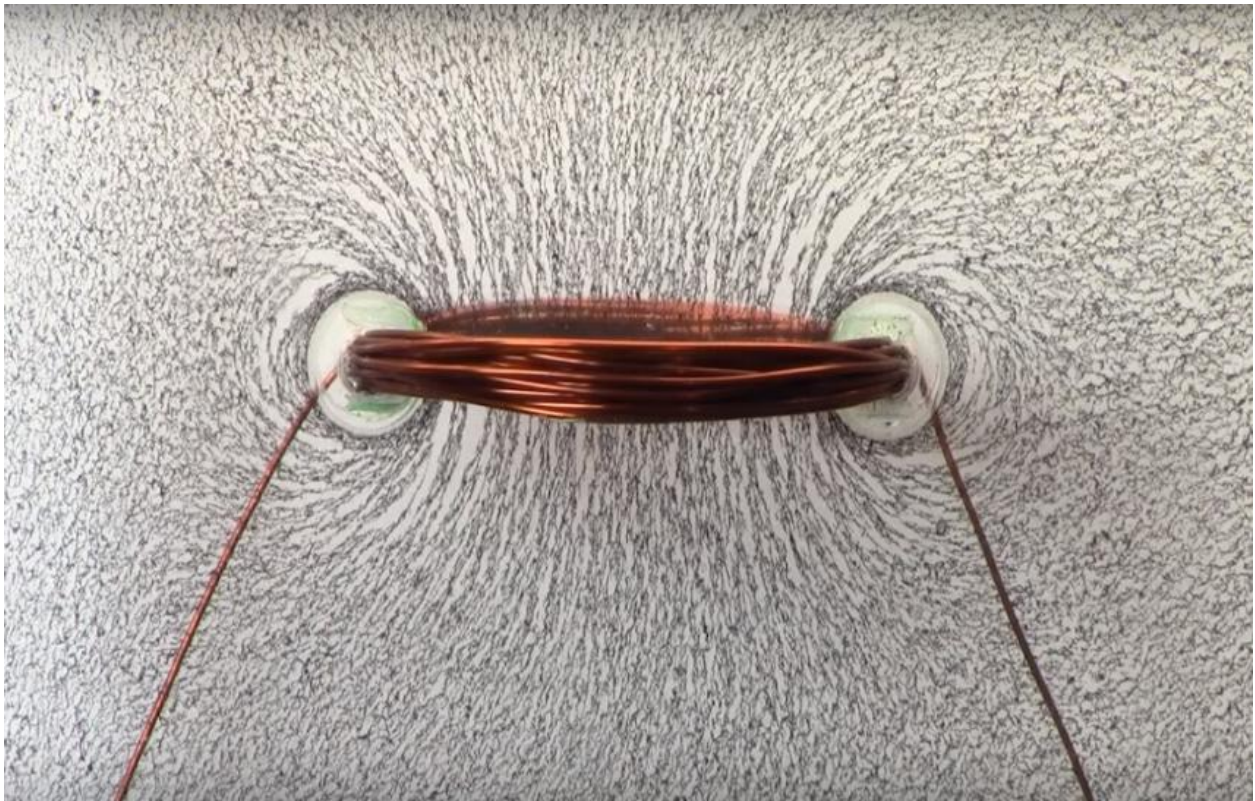


fig1. snapshot from
video <https://www.youtube.com/watch?v=V-M07N4a6-Y&t=346s>

side view of magnetic field of DC coil. Iron Fe powder was used

Rings a bell?...

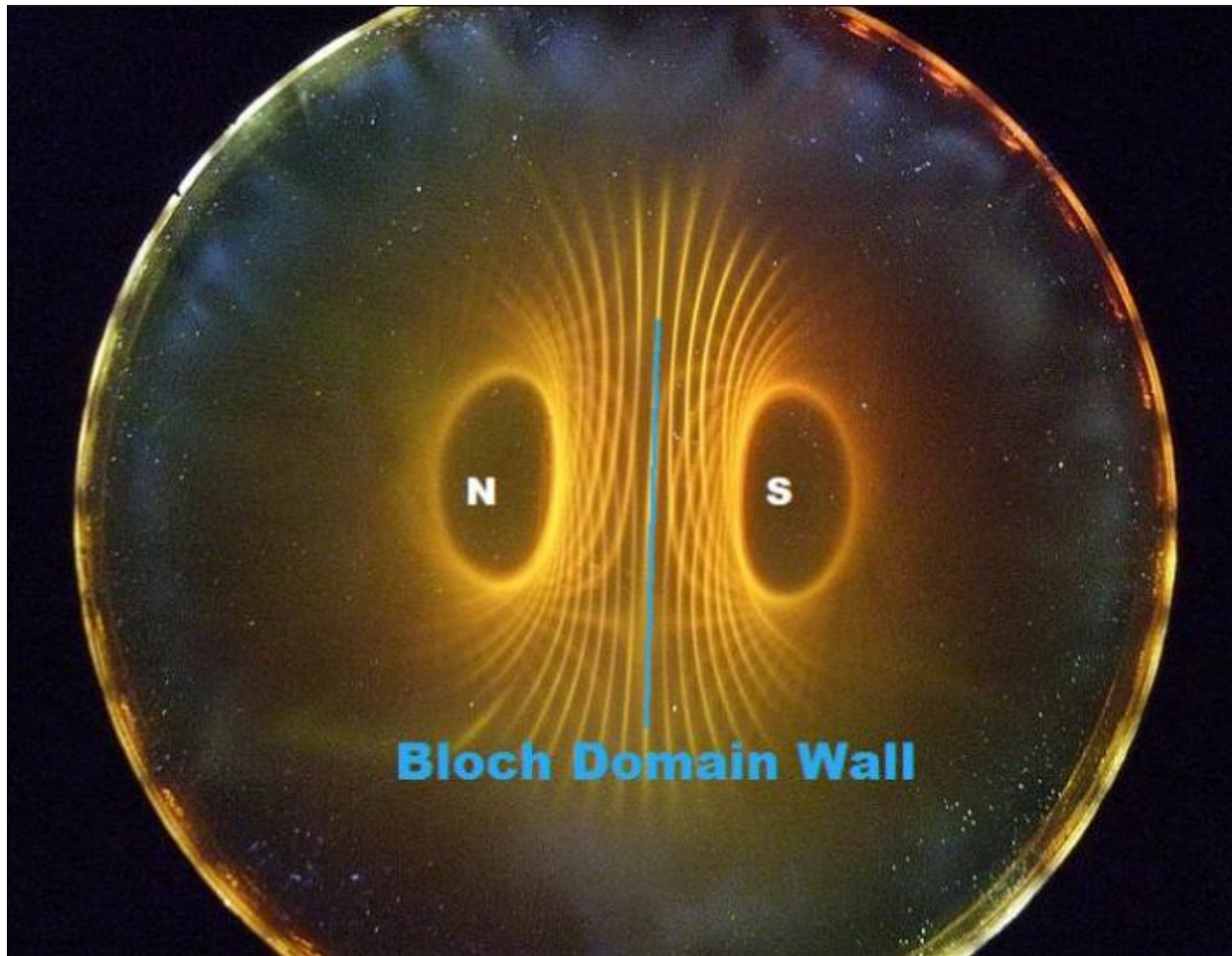


fig2. Side view of field of magnet shown with the ferrocell

However, there are some fundamental differences as shown in fig.3 below:

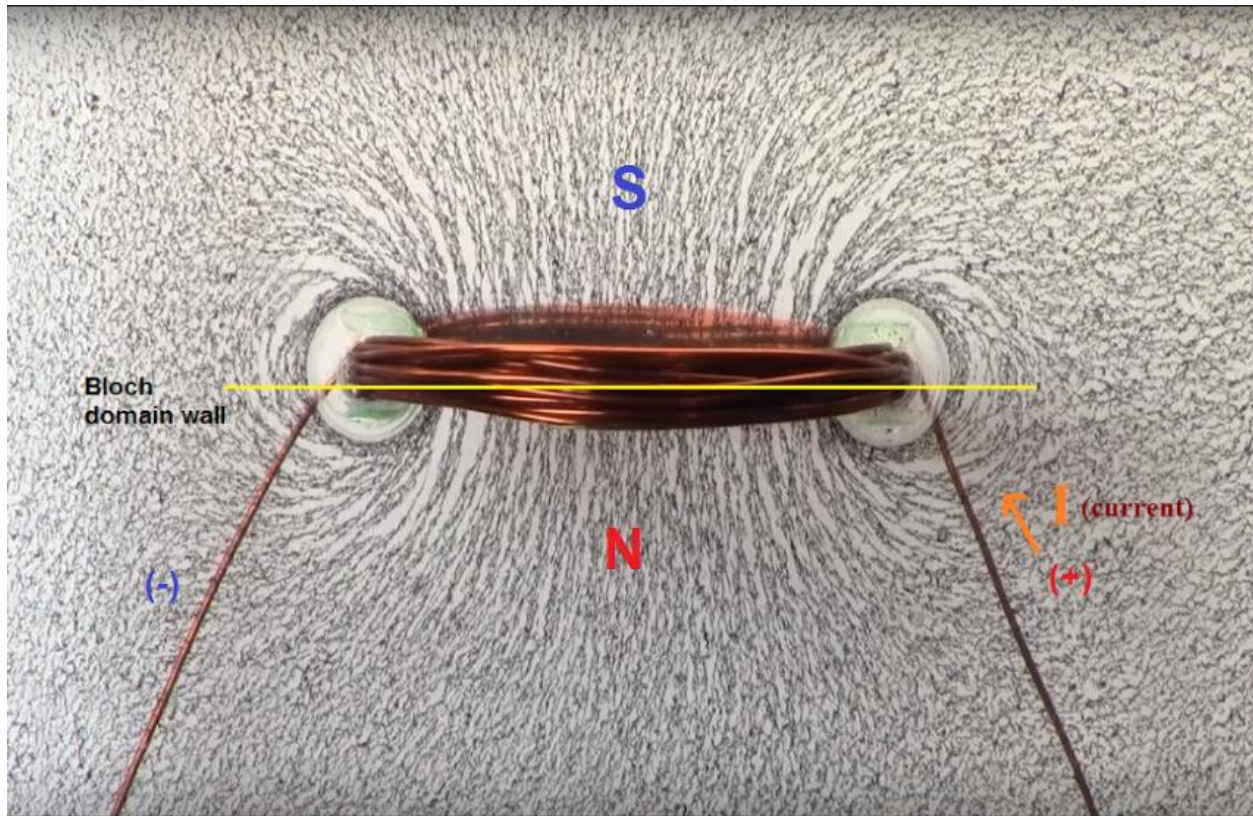


Fig. 3 Iron powder. Magnetic field of DC coil with polarities indicated using left-hand rule and electron flow direction.

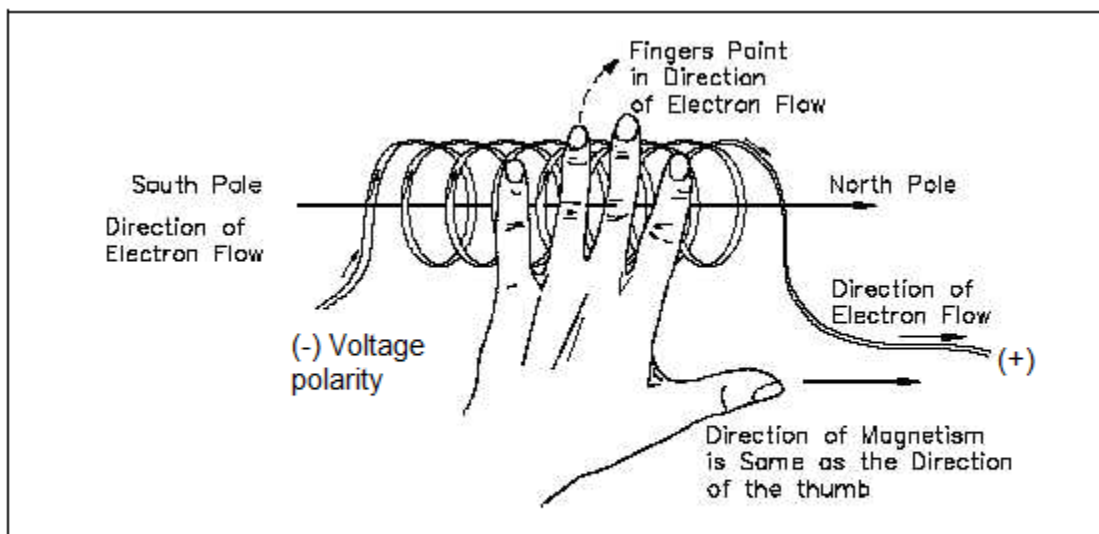


Figure 23 Left-hand Rule for Coils

Nevertheless, from the above, if ferrocell is not showing magnetic flux as some believe then iron powder does not show magnetic flux either...!

It all comes down to the 90° orientation displacement of the flux pattern shown by the two methods.

In fig.1 and fig.3 We see clearly the circular magnetic field (left and right) formed around the coil in each dissection of it as predicted by theory. However these are not the magnetic poles of the coil. The actual magnetic poles of the DC coil are indicated in fig.3 .

So what is happening here? If we observe the magnetic field of a permanent magnet shown by the ferrocell in fig.2 it is 90° turned compared with the field of the coil of fig.1 and fig. 3.

The notion that this is an artifact produced by the ferrocell must be discarded since we can see the actual flux lines in the ferrocell to terminate at the physical locations of the poles of the magnet (black holes in fig.2).

The other funny thing about the field of the coil shown in fig.3 and 4 is that flux lines are diverging on the poles but we can not see physically the poles of the coil in the iron powder pattern? Although theoretically they should have the highest magnetic potential and should perfectly produce two junks of iron powder up and down in figure 3&4. This is because I believe, that a coil is essentially emulating a closed loop permanent magnet (i.e. like the field of a torus solenoid or a radial magnetized ring magnet).

In other words I believe that the magnetic field generated by a DC coil (without core) has no any distinct spatial defined and focused two poles

as permanent dipole magnets have (i.e. no dipole, same case as the torus solenoid) and has instead spread its magnetic field all along its circuit length and inner area and as soon we get in area outside the coil the magnetic field is diverging (not focusing at any pole regions) and drops rapidly to zero.

<https://www.youtube.com/watch?v=n8LrtNQcf7Q> (
coil wire no detectable field in a ferrocell)

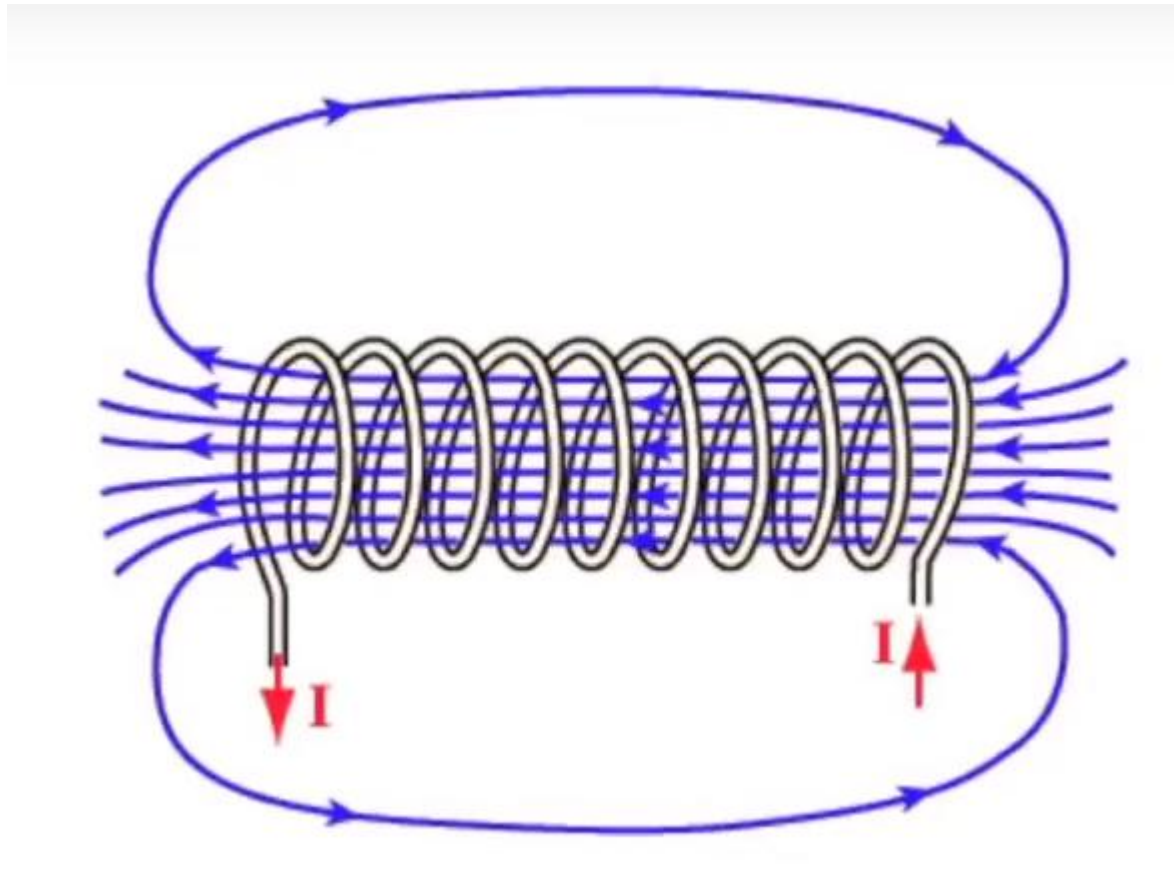


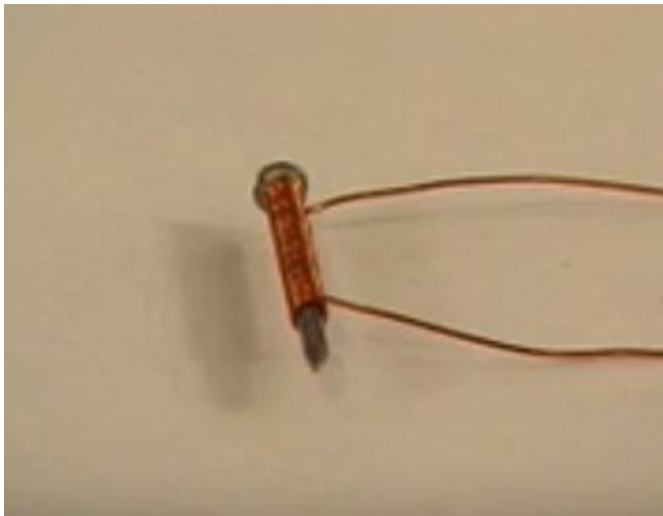
Fig.4 Coil Magnetic field schematic. No distinct poles at the two ends of the coil like permanent magnets have.

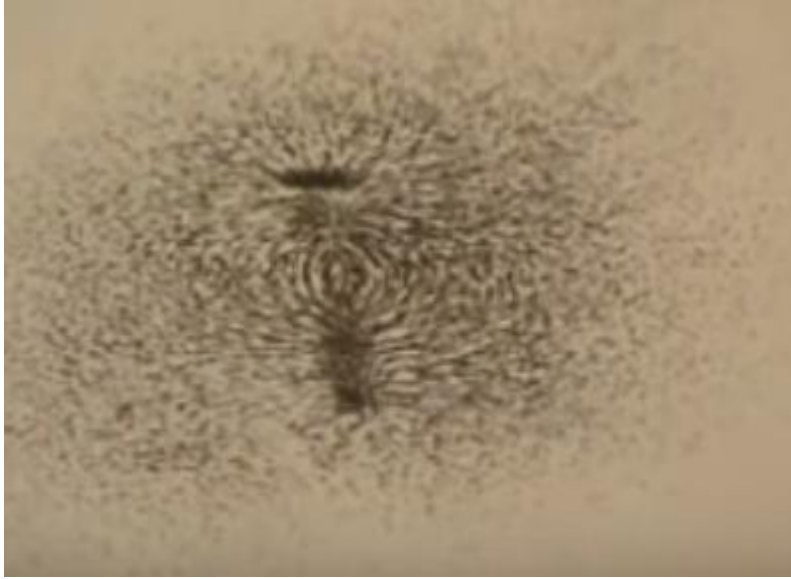
Video: <https://www.youtube.com/watch?v=bq6lhpfucE>

With that said, however the picture totally changes when a ferromagnetic core is introduced inside the

coil or other ferromagnetic material (including permanent magnets) are brought very close to the coil. In the case of magnets their fields interact and focus together producing polarity repulsion or attraction. When a ferromagnetic material is introduced inside or very near the coil, it gets magnetized and focuses the magnetic field of the electromagnet at the two spatial regions of the coil shown in fig.1 and fig.3 (up and down S-N poles shown).

This will produce the familiar bar magnet iron filings classical experiment macroscopic field pattern:





When a ferro core is introduced inside the coil only then its magnetic poles appear by the magnetized core at its two ends. Evidence that a DC coil without a core can not be regarded the same as an open ended bar magnet since essentially is a closed magnetic loop.

Video: <https://www.youtube.com/watch?v=CZKNI9WBIk4>

And also the familiar flux Quantum Field pattern we get from permanent magnets with the ferrocell:



<https://www.youtube.com/watch?v=wSANpJ3qS9c>

Electromagnet on ferrocell

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