

MEASUREMENTS OF MAGNETIC FIELDS - METHOD

Method

If we manage to create a resulting magnetic field vector as in Figure 4, we get the relation between the magnetic field vectors of Earth and coil

$$B_C = B_E \tan(\alpha)$$

Hence, by generating a known magnetic field in the coil and measuring the deviation α with respect the Earth's magnetic field vector direction of the resulting field, we are able to determine B_E

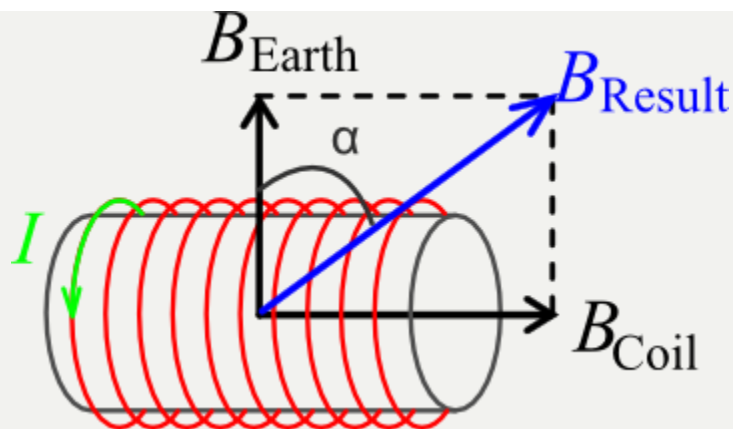


Figure 4. Relative orientation between the magnetic field vectors

As we have seen in the Background section, when an electric current flows through a coil wire, it generates a magnetic field. Therefore, in the laboratory we will assemble the circuit in the diagram of Figure 5. In the diagram we can see that, in order to limit the electric current flow and prevent the coil from burning, due to the fact that the coil wire resistor is usually very small, it is necessary to mount a resistor in series. So,

- first, we are going to compute the coil wire resistor.
- Then, we are going to assemble the circuit and compare the coil with a magnet
- Finally, we are going to compute the Earth's magnetic field

Source: <http://web.ua.es/docivis/magnet/method.html>