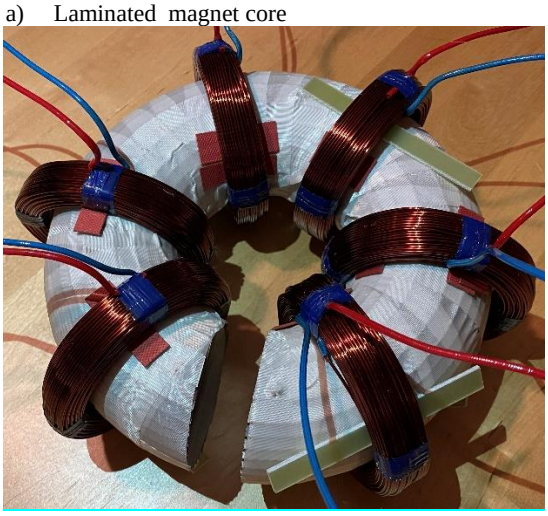
with an increased energy cost, so that this balance needs to be better evaluated when developing the relaxometer.

4. Magnet Assembly

To create the prototype of the laminated magnet core system only two components are required: the coils and the thin iron plates (sheets), known as laminations. The laminated core's building (see Fig. 5) was outsourced, being composed of 0.5 mm thick iron sheets.

a) Laminated magnet core



b) Assembled magnet

Fig. 5. Magnet: a) Laminated core; b) Assembled magnet system.

5. Conclusion

An innovative FFC NMR magnet system was successfully designed and build with the purpose of enhancing the relaxometer's usability, by increasing its portability capacities. Two solutions in terms of the magnet's core composition were tested and fully characterized in terms of their field homogeneity, fringing effect and heating/cooling effects.

It was possible to disregard the approach of using iron fillings to form the magnet's core since, from a technical standpoint, it was not feasible to develop this magnet with the desired characteristics.

Relatively to other FFC magnets, the main advantages of the designed magnet are: the reduced volume (and weight); the high homogeneity of the induced field in the gap region; the low power demands; and the ability to have complete freedom of rotation in all three axes. The aditional degrees of freedom for samples' insert in the magnet's gap. All these advantages contribute significantly to the increase of the relaxometer's portability capacities and obtain a new concept of FFC NMR relaxometer.

As final reak, it should be pointed out that the proposed magnet layout constitutes a step forward towards the usability of the FFC NMR technique *in situ* in addition, as by now, in research laboratories.

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