Instruction for using MR-compatible tDCS

Roya Jalali & Joe Galea

rxj237@bham.ac.uk
J.Galea@bham.ac.uk
1. MR-compatible tDCS consists of a battery, two boxes (only one is MR-compatible) and three optical cables. The non-MR box and battery have to be in control room and two boxes are connected through the green cable.

2. In order to use MR compatible-tDCS, electrodes has to be attached to the head/body using conductive gel (EEG paste) instead of saline solution. Before attaching the electrode, clean the area with 70% Isopropyl Alcohol and put a small amount of conductive gel directly on the bald part of the head and not on the hair. Spread a small amount of gel on the electrode smoothly and place the electrode on the area of interest. (Gel can be removed by warm water.)

3. Before attaching any cables to the battery, turn on the tDCS first to prevent any power surge (otherwise the optical cables can damage and costs a lot of money).

4. Then check tDCS can reach the current that is needed for your study. In case it doesn’t work because of high impedance, you need to check the gel is only on the skin and there is no thick layer of hair in between. Green cable also has to be straight during the stimulation.

5. After you are sure tDCS is working, you can wrap the electrodes by Coban tightly (not too much that participant feels uncomfortable).

6. It’s a good idea to check tDCS again that still is working.
Set up in scanner room:

There should be no twist in the green wire around the scanner. Make sure wire is close to the wall.

MR-compatible filter box sitting on a piece of foam, which ensures wire does not touch the bore.
Set up in control room:

In order to have the least artefact, non-MR compatible box should be positioned in rear patch panel:

- TtDCS has to be “switched ON” and in “standby” when cables are attaching or detaching.
- During fMRI, tDCS should be “stimulating” because “standby” gives artefact.
- In case you don’t need to stimulate the brain, you can start stimulation by “0 mA” and increase the current when stimulation is needed.