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LIÈGE universit
Sciences Ap

MATH0471-MULTIPHYSICS
INTEGRATED COMPUTATIONAL
PROJECT

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Intermediate report 1

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0.1 Questions to ask on February, 20

- Do we have to take into account the frequency-dependency of the electromagnetic properties of the materials? (see https://em.geosci.xyz/content/physical_properties/magnetic_permeability/magnetic_permeability_frequency_dependent.html)
- Regarding the already-written code:
 - Comments on the created classes?
 - Is speed affected? Or we don't care?
 - Especially, ask if `Array_3D_Template<Node> nodes` is a good way to start !
- Regarding testing, what are the simplest tests? Could we compare our results with other simulations? Do we have to compare with something that can be hand-solved?
- Check our reasoning on the nodes. They all have:
 - 3 coordinates (3 doubles) - How are we going to mesh ??? (we think we are obliged to keep rectangular parallelepiped because of the numerical scheme)
 - 6 fields (3 for \vec{E} and 3 for \vec{H} so 6 doubles)
 - 1 temperature (1 double)
 - 1 unsigned char for the ID of the material
 - \Rightarrow That would make 10 doubles and one unsigned char or $10 \times 4 + 1$ bytes per node.

0.2 Database for human tissues

<https://www.itis.ethz.ch/virtual-population/tissue-properties/downloads/database-v3-1/>