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Development of Brain Phantom for Neuromodulation and Neuroimaging CIRO ALCOBA SERRATE, Department of Nuclear Engineering, Virginia Commonwealth University, Richmond VA, US, ERIK LEE, Department of Psychiatry, Massachusetts General Hospital, Boston, MA, US, RAVI HADIMANI, Department of Nuclear Engineering, Virginia Commonwealth University, Richmond VA, US — We are developing a method to 3D print an anatomically/physically accurate human head phantom with same electrical properties of the human head. This Phantom is being developed for evaluating Transcranial Magnetic Stimulation procedures used in treatment of neurological disorders. Its development could have many applications in the medical field such as Deep Brain Stimulation training. The plan for fabricating this head phantom is to create shells for the brain parts. Today's 3D printing technologies we are limited to materials that have predefined electrical conductivity and magnetic. 3D printing technology has not been able to provide a printer that allow us to modify the electromagnetic properties of the materials. Shells of the parts of the head are being printed to fill these hollowed gaps in the shells with composite gels that mimic the electromagnetic properties of different parts of the brain. So far we have been able to print individually every single part of the brain in shells and half assemblies of some parts of brain. Shells are created from MRI images of brain scans and editing them using a mesh-mixer. This software will be used to assemble these parts of the brain to be printed that will enable use of phantom head for neuroimaging/neuromodulations applications.

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