fMRI Tests for Neural Gravity: a Proposal

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Abstract

In this note the authors provide a proposal for an fMRI test for g-wave induced modulation of neural activity in nerve tracts.

It was shown mathematically in [1, 2, 3] that metric perturbations impinging on an axon tract will impact the time coded neural information carried by the tract. In this note we suggest how this modulation might be detectable in fMRI studies of the tract.

Consider a tract of ephaptically coupled axons[1]. A metric perturbation modulates the action potential profiles. This changes the extracellular medium's charge distribution dynamics which in turn impacts the boundary or epineurium potential. A modified epineurium potential leads to interaction with neighboring pericytes. These pericytes interact with blood cells and this ultimately generates an impact on the fMRI signal from this region.

If the fMRI of blood vessels in say a mammalian olfactory bulb is recorded and all known modulators of the fMRI are accounted for, then one may be able to isolate a disturbance whose primary cause will be the gravitational waves impinging on the bulb. This fascinating study seems to be within the reach of present-day technological capabilities.

References

[1] Aman Chawla, Salvatore D. Morgera, and Arthur D. Snider. Fields, geometry, and their impact on axon interaction. *Journal of Applied Mathematics and Physics*, 9(4):751–778, 2021.

[2] Aman Chawla. A gedanken experiment on the brain as a quantum computer. *ResearchGate Preprint*, 2022.

[3] Aman Chawla and Salvatore Domenic Morgera. Mechanism of universal quantum computation in the brain. *Journal of Applied Mathematics and Physics*, 12(2):468–474, 2024.

[1] Background reading for this note is [4] and the references therein.

[4] Aman Chawla, Salvatore Morgera, and Arthur Snider. On axon interaction and its role in neurological networks. *IEEE/ACM Transactions on Computational Biology and Bioinformatics*, 2019.