Relativity Using Massless Waves in Medical Imaging

+ Introduction

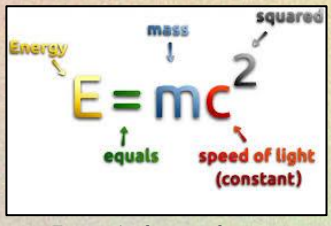

Figure 1: shows relativity equation.

The infamous fundamental physical law $E=mc^2$ that was firstly defined by Einstein which relates energy with mass of object states that everything that has energy must have corresponding mass and vice versa [1]. The rule does not have a certain threshold or limit which makes it applicable at any state. The use of relativity in medical imaging will enhance the quality and performance even more than before.

+ Rule Broken

As mentioned earlier, the law is applicable at any state. What we are going to break here is the validation of that law, we will assume that there is some threshold of energy required for the validation of the law and that threshold is "10^{-17} Joules", and we have chosen that threshold because the current sensors can detect 10^{-18} joules like optical and quantum sensors which makes our idea applicable with the current technology.

+ Technology Mechanism

1. Wave Emission: Generates mass-less waves with energy below $E_{threshold}$ avoiding harmful radiation.

2. Quantum Interaction: Waves induce safe temporary modifications to the tissue's quantum characteristics.

3. Detection: Detectors measure changes in quantum properties after waves exit the tissue, noting shifts in energy levels and electron spin configurations [2].

4. Data Processing: Advanced algorithms and a database correlate quantum change with tissue characteristics, creating a 3D representation.

5. Multi-Angle Imaging: Waves are directed from various angles to complete the 3D model.

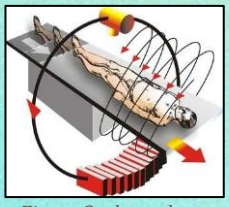

Figure 2: shows how Multi-Angle Imaging occurs.

+ Benefits

1. Safety: Waves below the $E_{threshold}$ are fundamentally safe and non-ionizing, thereby reducing the risk to patients.

2. Early Detection: The system's high sensitivity to changes in quantum properties enables the early identification of abnormalities such as cancer.

3. High Resolution: The imaging capabilities provide a level of detail that exceeds that of conventional methods, making it particularly suitable for intricate diagnostics.

4. Non-Invasive: The system operates without any physical contact with the tissue, eliminating the potential for harm or discomfort.

+ Drawbacks

1- Requires extremely sensitive quantum state detection sensors and advanced algorithms which will increase the cost

2- A small error in the energy of the massless waves will lead to wrong diagnosis and accordingly, a lot of precautions must be taken.

+ References

[1] S. R. Fiorentin, "A Re-interpretation of the concept of mass and of the relativistic mass-energy relation," Found Phys, vol. 39, no. 12, pp. 1394–1406, 2009, doi: 10.1007/S10701-009-9359-9.
[2] H. Buhrman, R. Cleve, J. Watrous, and R. de Wolf, "Quantum fingerprinting," Phys Rev Lett, vol. 87, no. 16, p. 167902, Oct. 2001, doi: 10.1103/PHYSREVLETT.87.167902.