UNDERSTANDING the DIFFERENCE BETWEEN GROUP and INFORMATION VELOCITIES in FASTER THAN LIGHT DISPERSION
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ABSTRACT
In dispersive materials the speed of light within them are frequency dependent. At frequencies near resonance the index of refraction is below one and the group velocity is greater than c, known as anomalous dispersion, but the information velocity is not greater then c. Understanding why superluminal, faster than light, group velocities do not violate relativity offers key insights into other anomalous effects such as quantum tunneling as well as further understanding of the difference between phase, group, and information velocities.

OUTLINE
1. Understanding the group and phase velocities in dispersive materials.
2. Understanding anomalous dispersion in materials.
3. Why is $v_g \neq v_i$ where $v_i$ is the rate of information travel.
4. Connections to quantum mechanics and conclusions.