A Quartz "Chi" Detector

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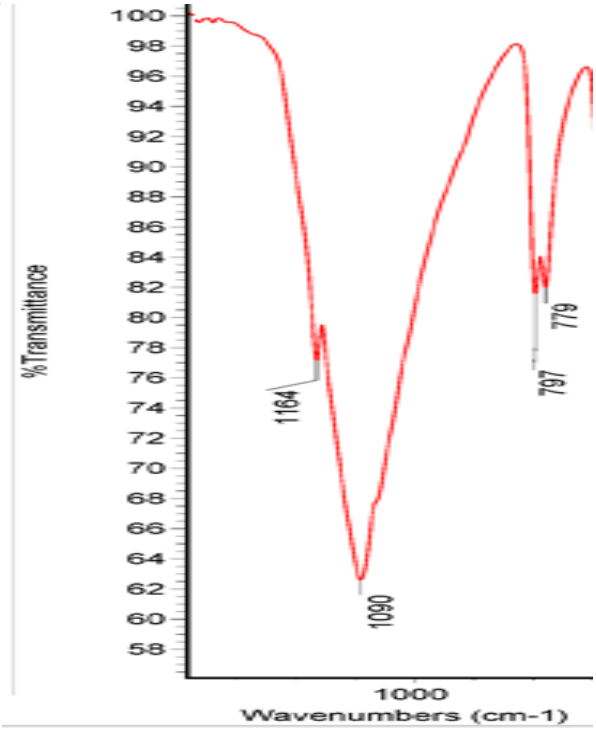
It has bugged me for 35 years that the equations for electromagnetism include a mathematical "imaginary" component, and that all the equations are processed using both the "real" and "imaginary" parts, but then to take measurements the imaginary parts are then just ignored "because they have no meaning".

That's because I know for a fact from many, many first-hand experiences that feelings and thoughts can be transmitted and received, just like radio waves. I'm not going to explain or justify that statement, you can accept it, reject it, or tentatively accept it as a working hypothesis.

So, I've always wondered : what's the mechanism in this physical universe that allows thoughts and feelings to be transmitted and received? Perhaps the mechanism is "outside" our physical universe, in which case nothing more can be done. But if it operates "inside"…

Over many decades of thinking and researching this, here's what I've come up with :

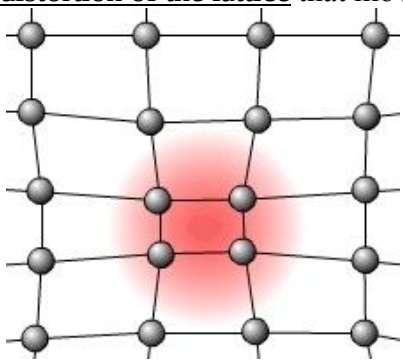
- For convenience, let's call the energy that's "carrying" the thoughts and feelings "chi".
- Let's assume chi is carried in the imaginary component of electromagnetic energy. *Please note that this is the only assumption being made – **all the rest is standard physics**!*
- According to the equations of quantum mechanics, when a substance is within a strong magnetic field, the probability functions of its electrons become "complex" – they now have a "real" *and* an "imaginary" component. There is no imaginary component without a magnetic field (actually, there is always a self-induced orbital magnetic field, but it is usually small).
- If chi is the imaginary part of an EM field, then it should be able to be absorbed by an electrons' complex probability function, including by any molecular (electron-electron) bonds in the material.
- Quartz has a point of relative maximum absorption *almost exactly* at body temperature. That means quartz is very efficient at absorbing the infrared (IR) photons put out by body-heat, presumably carrying the chi in the imaginary component :



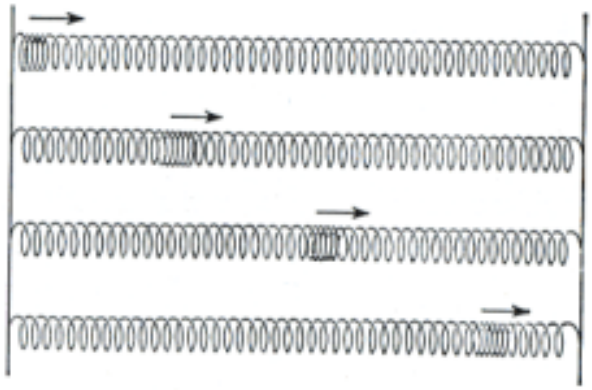
Body heat ^^ (~1070 cm-1)

- This energy is being absorbed by the crystalline *structure* of the quartz by stretching, bending, twisting, or otherwise distorting the shapes of the electron-electron bonds between the atoms in the crystal.

- "Phonons" are the quantized vibrations of a crystal lattice at a microscopic scale. Think of a phonon as a localized distortion of the lattice that moves thru the crystal and doesn't quickly disperse :



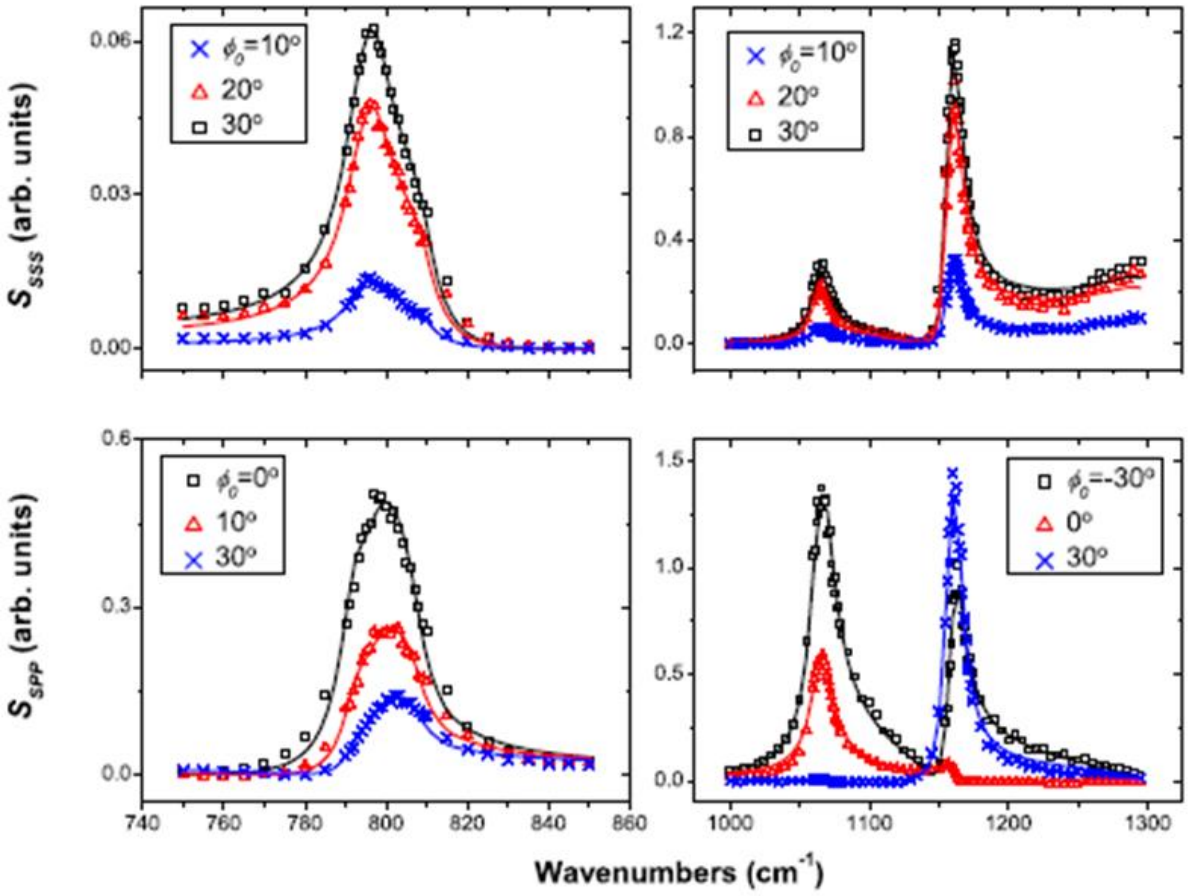
Red area = "phonon" (static, 2-D)



Phonon in motion (dynamic, 1-D)

In the right pic, *each coil* is an atom, and the bunched coils are a phonon, moving left to right over time.

- It turns out that the IR being absorbed by the quartz is very effectively turned into phonons because quartz has a strong "electron-phonon coupling" (graphs from "Sum-Frequency Spectroscopy on Bulk and Surface Phonons of a Noncentrosymmetric Crystal", by Wei-Tao Liu, Y. Ron Shen) :



Body heat : ^^ (upper and lower graphs)

The vertical axis is the relative amount of phonon production. (φ_0 is the angle "around" the crystal that the IR photons *come in at* – in the detector below, all angles would be covered.)

- Finally, quartz can turn phonons into electrical signals because it is piezoelectric. Hopefully these electrical signals still have some relation to the chi that made them.

So to create a "chi detector" :

- Get a high-quality, naturally-cut quartz crystal.
  - The crystal should be cut along its natural lines of cleavage.
  - There is synthetic quartz which if it has been cut, is hard to tell apart from natural. Uncut, it has a wavy surface. You do *not* want "fused silica" or "fused quartz".
  - All natural quartz is "α" or "alpha" quartz. "β" or "beta" quartz only forms at high temperatures.
- Put it in a strong (preferably? uniform) magnetic field.
  - Electromagnet around the crystal : wire blocks the IR; the electric field might distort the crystal
  - Permanent magnets : no blockage, use neodymium magnets (with care!)
- Attach electrical leads to each of the six faces of the quartz crystal, leaving as much of the crystal uncovered as possible.
  - "Sputter" a thin film of metal on each face of the quartz, and solder wires to it. This is expensive, and generally places a conductive "adhesive" layer between the metal and the quartz anyway.
  - Lay a thin copper wire on the quartz face using a commercially-bought conductive glue.
  - Lay down a line of just the conductive glue, with just a contact wire lead at the bottom.
- Send the 6 signals thru a moderately-priced commercially-bought EEG amplifier (it should have high amplification, good noise reduction, and multiple channels, *all built-in*).

There are now 5 (if you pick one as ground) or 6 time-varying signals to analyze. That's 3 pairs if you use signals from opposing faces, or 15 different pairs altogether. Here, you're pretty much on your own. IF there are no important super-high-frequency components to the signals, digitize them at a high sample rate and store them for computer program processing. I can think of three places to start :

Display signal pairs "live" on a very-high-BW oscilloscope as Lissajous figures. This might confirm or rule out high-frequency components, and will show time-varying phase shifts between signals.

Use *time-varying signal analysis* or a *fast Fourier transform* to find patterns, if not ultra-high-frequency.

Testing : cup your hands close to the crystal without touching it. Or if the apparatus is moveable, hold it close to the center of your chest, covered by one hand. AFAIK, you should get no signal without the magnets.

Once you get a measurable change when the crystal is far from people vs. near a person, try it on different people, see what different readings you get. Try someone who's been meditating for years, if possible.

Experimental gotchas

Getting "good" quartz crystals. Lots of "crystals" might be glass (non-crystalline) or not cut correctly.
Determining the *optimal* strength of the magnetic field. A coil would be good for this, with the above cautions.
Quality of the conductor and especially the conductive glue used on the crystal faces. Maybe make your own.
I've always thought the conductor on each crystal face should be a long wire, but perhaps just a small "dot" of conductor at one end, or even the middle, would be better. Maybe *2 dots at each face end* per "signal"?
The crystal must be as isolated as possible from all vibrations, which will cause electrical signals!
EM noise – there will be 60 Hz, radio and TV, cell phone and wireless signals to filter out.
The electric signal created by phonons is going to be miniscule – you'll need a low-noise, high gain amp!
Phonons created by IR can have frequencies in the 4-11 THz range, so you *may* need super-fast equipment! But hopefully the actual signal information is lower in frequency than the phonons themselves.

Actual apparatus would probably be vertical, → to allow incoming IR from all angles