-In QM, more oscillations/waves in the wavefunction (e.g. in electron orbital wavefunction) = higher energy = less energy (= lower energy photon = less oscillations in the e-quant) needed to free the particle.

-Note that quantized emission-absorption ⇔ wave amplitude is irrelevant.

-About the *statistical nature of QM*: Perhaps wave eigenfunctions always* represent the physical particle, and probability only comes in with superpositions of eigenfunctions. *This is probably not true though, since each eigenfunction is used in a statistical manner, and since there are some weird wavefunctions (e.g. free particle wave functions, which are just regular plane waves and superpositions thereof).

-QM and EM wave mechanics both have a 'path integral' formalism but CM is a little different (Lagrangian/Hamiltonian/proper time maximization)

-Is it in principle impossible to create a detector that can measure the direction of a particle's spin without changing the direction (i.e. measure the exact original direction of the spin, not z-axis projection)? If not, why not?

**Bell's Theorem**

A possible resolution of the classic Bell's theorem problem as presented in his paper: Suppose that the 'spin' of a particle can indeed point in any direction, and that particles A, B are created with oppositely oriented spin.

When the spin of particle A is measured by detector A, detector A forces spin A to align along the detection axis of A, and measures it as being either aligned (up) or antialigned (down).

Now consider what happens when the spin of particle B is measured by detector B. Suppose that the arbitrary direction of a particle's spin fully/mostly *determines* whether the spin will be measured as 'up' or 'down' along some detector's arbitrary axis. Also, remember to consider the orientation of the detection axis of B versus that of A.

Then the spin of particle B will be… ah, if the detector axes are differently oriented then it becomes tricky. But if they're oriented the same/opposite way then it's easy.