Quantized Spheres

A quantization of Maxwell's wave

Béatrice Reuillard

Is quantum theory exact?
The quest for the spin-statistics connections violation and related items

Laboratori Nazionali di Frascati INFN
4 July 2018

QUANTIZED SPHERES

1/ Proposition of geometry in 2D for :
--- a monochromatic photon's wave
--- a full chromatic photon's wave
--- its spectrum and superposition states

2 / Proposition of geometry in 3D for :
--- photon's wave
--- Electromagnetic wave

3/ The photon's wave in perspective with the Schrödinger equation

4/ the collapse wave

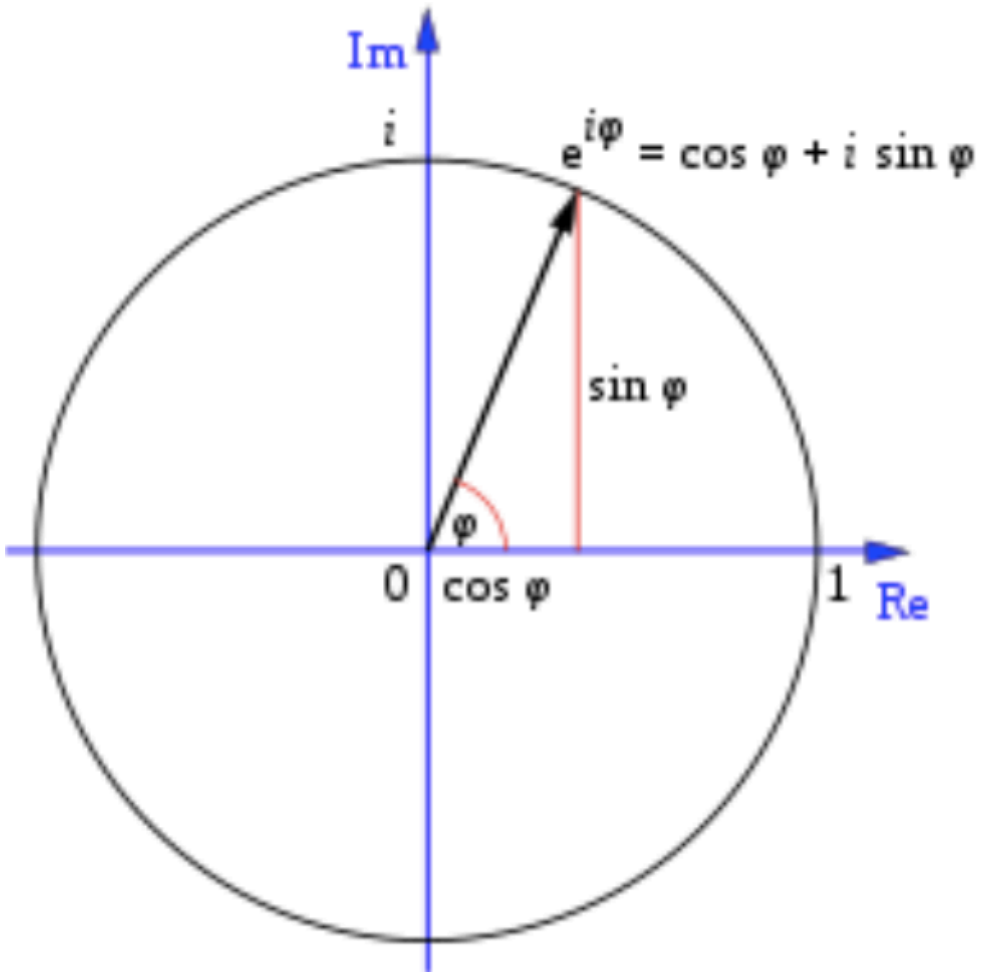
5/ the interference pattern

6/ Correlation and entanglement

7/ Conclusion

Euler formula

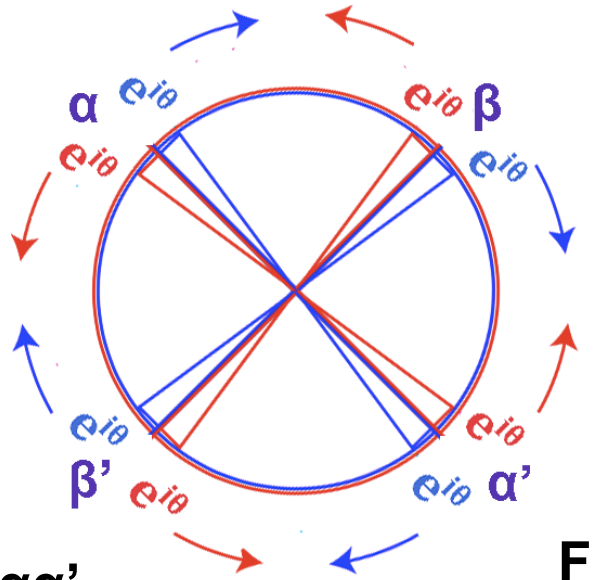
$$e^{i\varphi} = \cos(\varphi) + i\sin(\varphi)$$



8 $e^{i\theta}$ = 2 groups of 4 $e^{i\theta}$ in opposite rotation

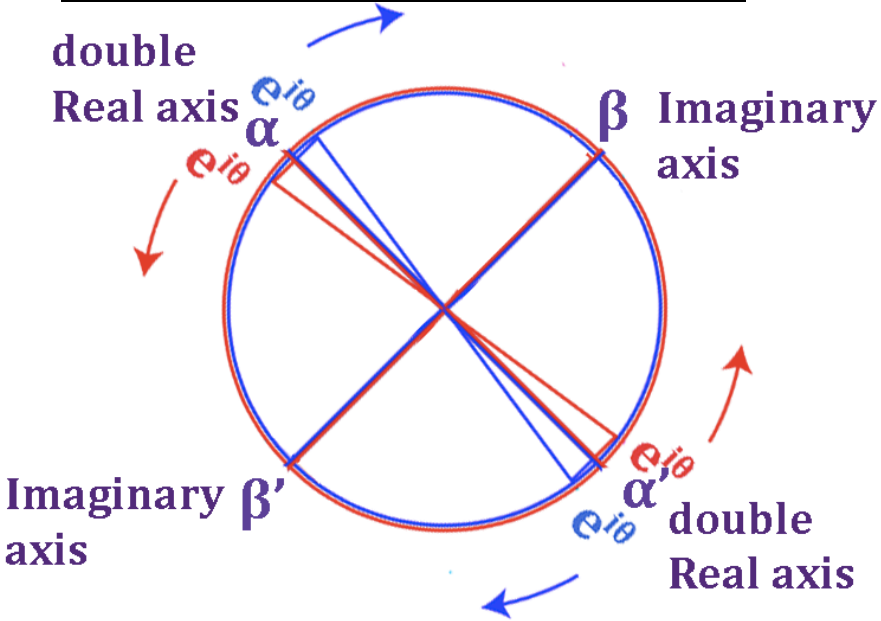
Real axes and imaginary axes of both groups of 4 double pairs

4 x $e^{i\theta}$

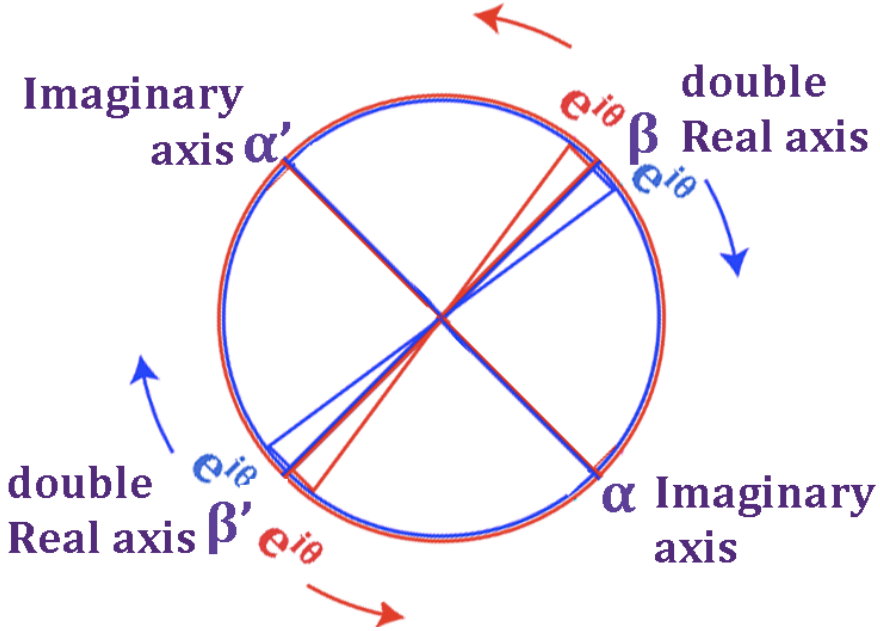


4 x $e^{i\theta}$

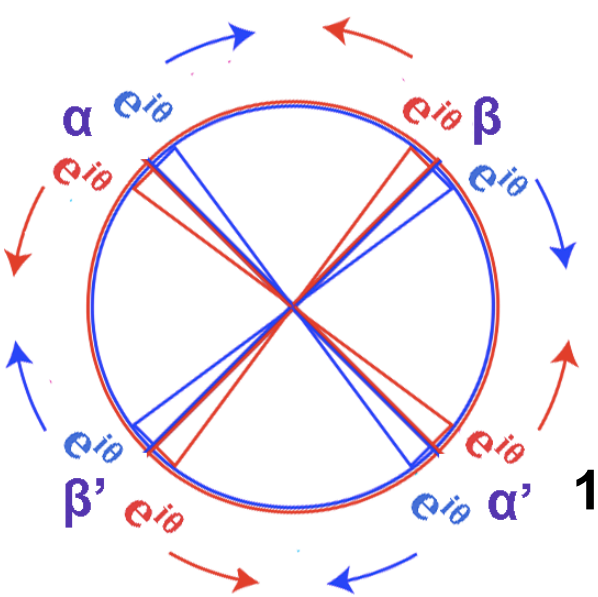
For the 2 $e^{i\theta}$ pairs axis αα'



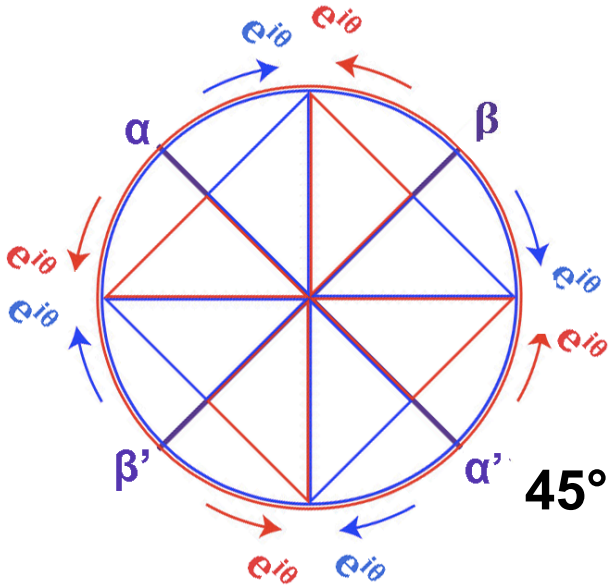
For the 2 $e^{i\theta}$ pairs axis ββ'



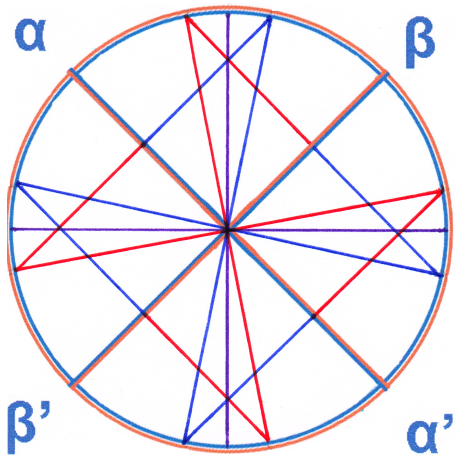
Different positions of the 8 imaginary numbers i with different value angle



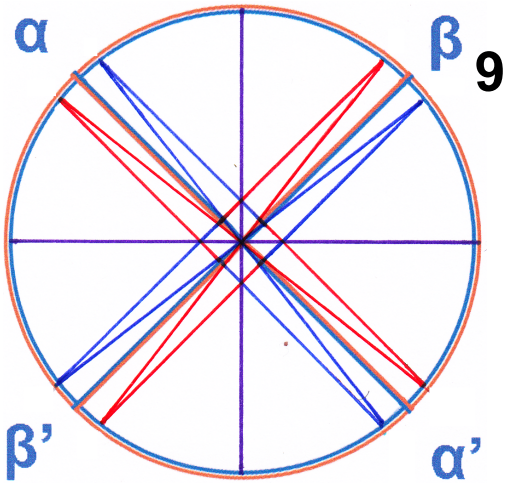
1°



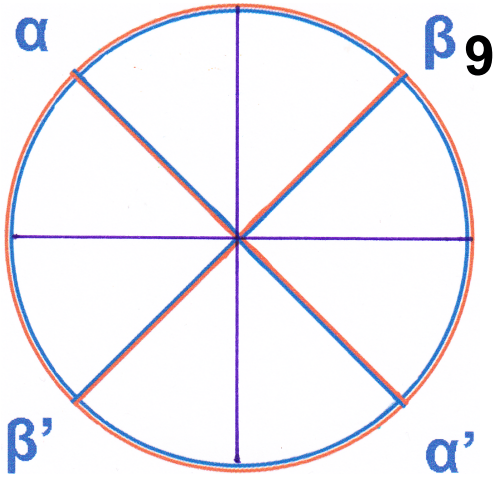
45°



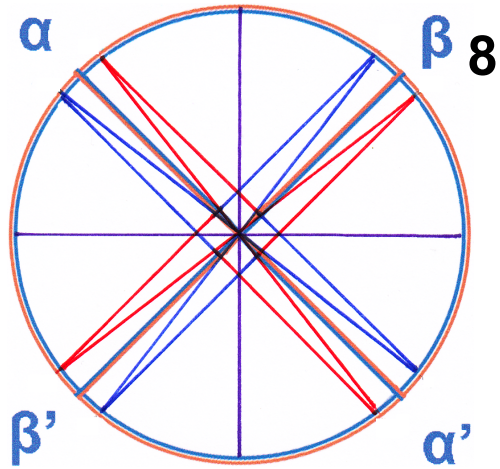
50°



95°



90°

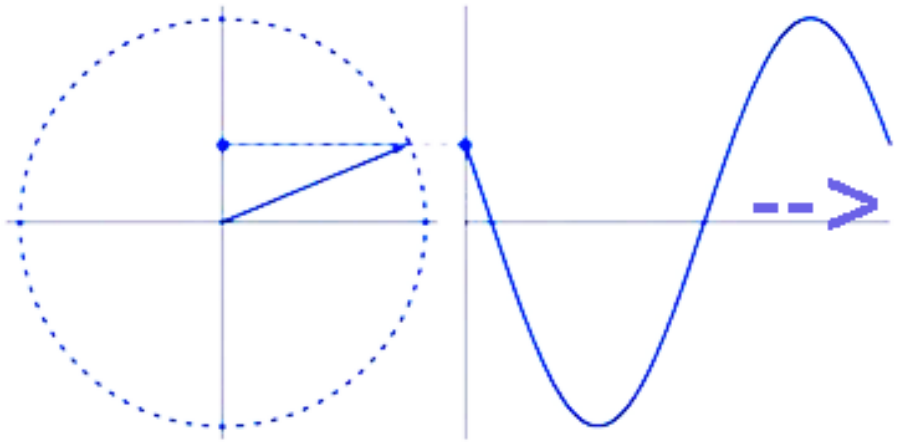


85°

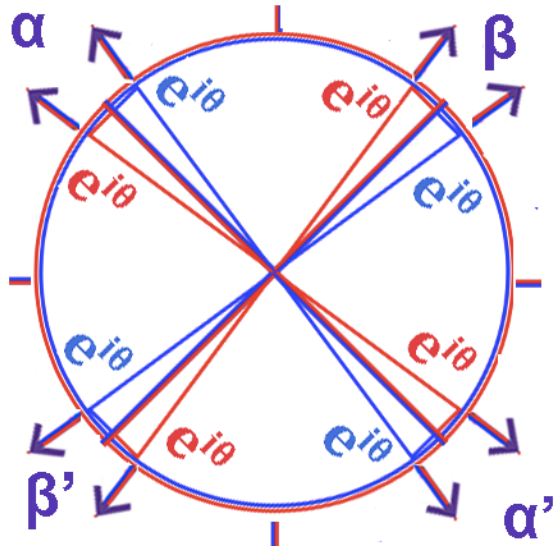
Beyond 90° the 2 pairs of $e^{i\theta}$ of a same axis swap their poles

Creation of a wave

For the classical model



For the 8 $e^{i\theta}$ Model

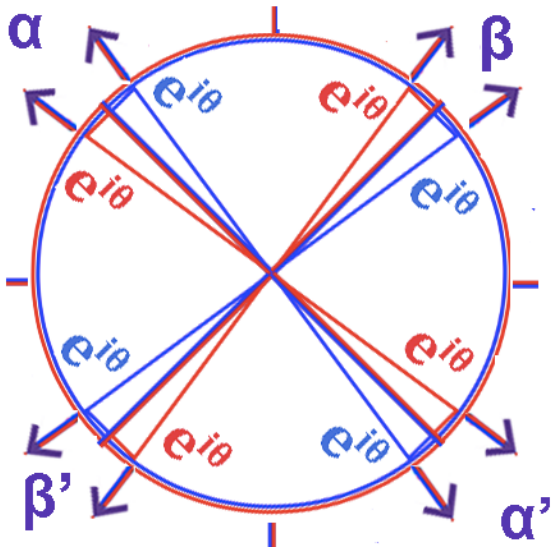


A shift added simultaneously to the rotation of the unique $e^{i\theta}$ creates a sinusoidal wave

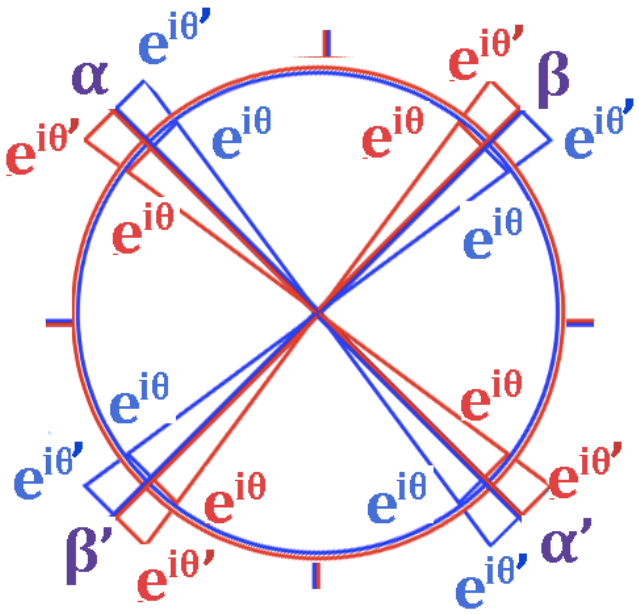
For the 8 $e^{i\theta}$ a shift is added in 8 different directions.
The 4 axes made by a pair of hypotenuses are increasing in opposite direction

Photon's wave propagation through duplication of the 8 $e^{i\theta}$ Matrix

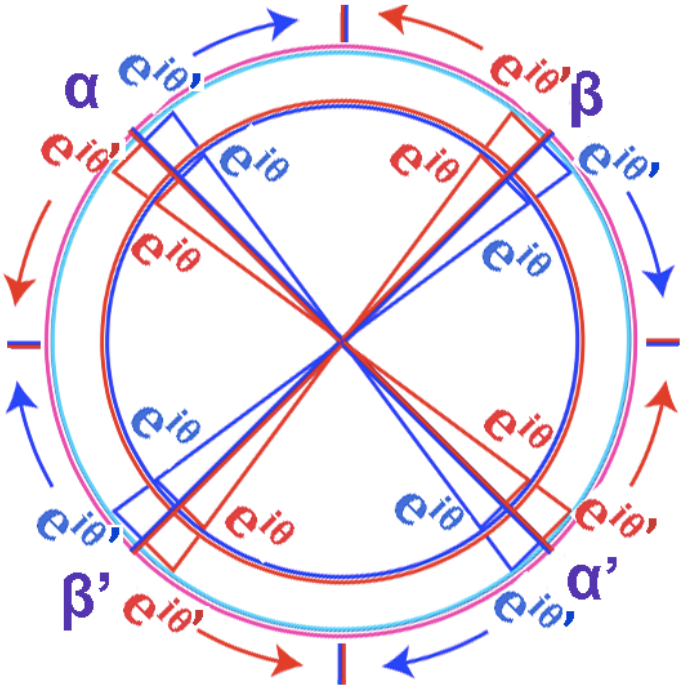
due to 8 shifts in opposite directions per pair



1/ with space added, hypotenuse lengths increase and



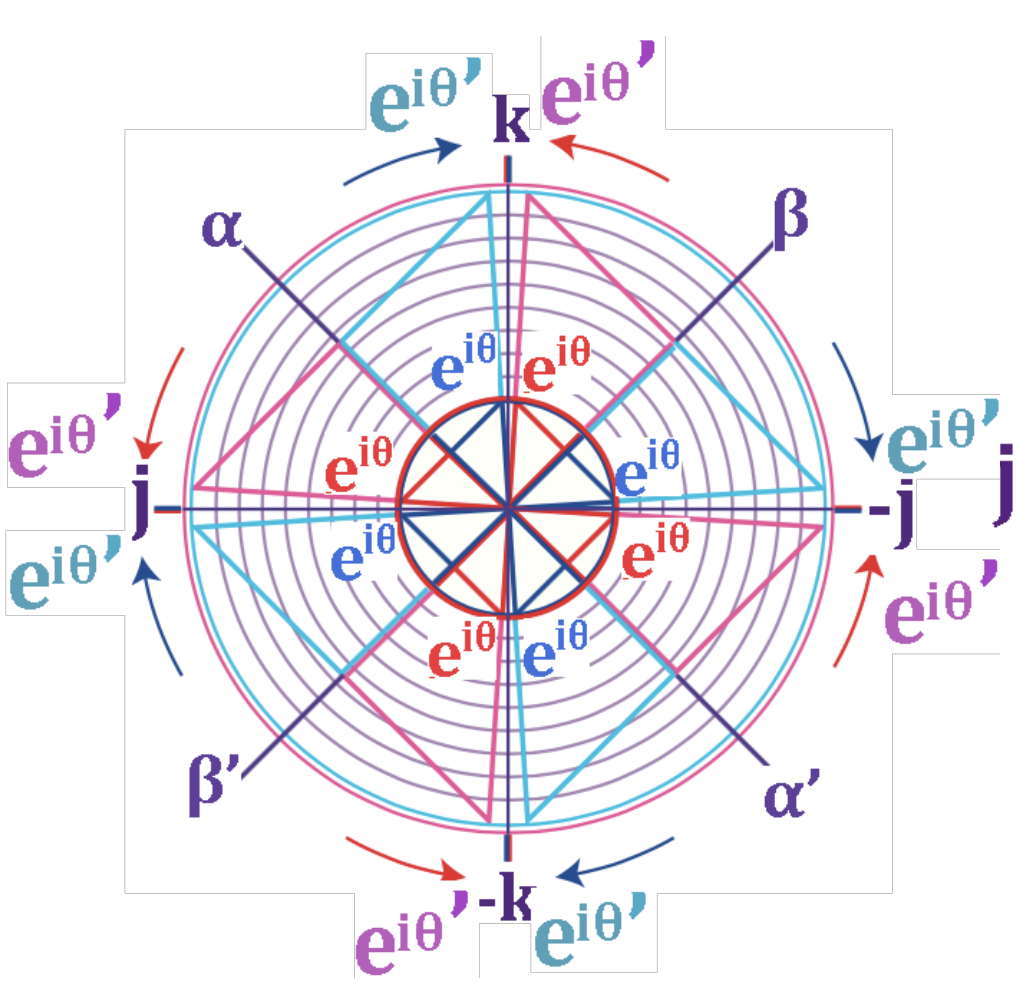
2/ create 8 new $e^{i\theta'}$



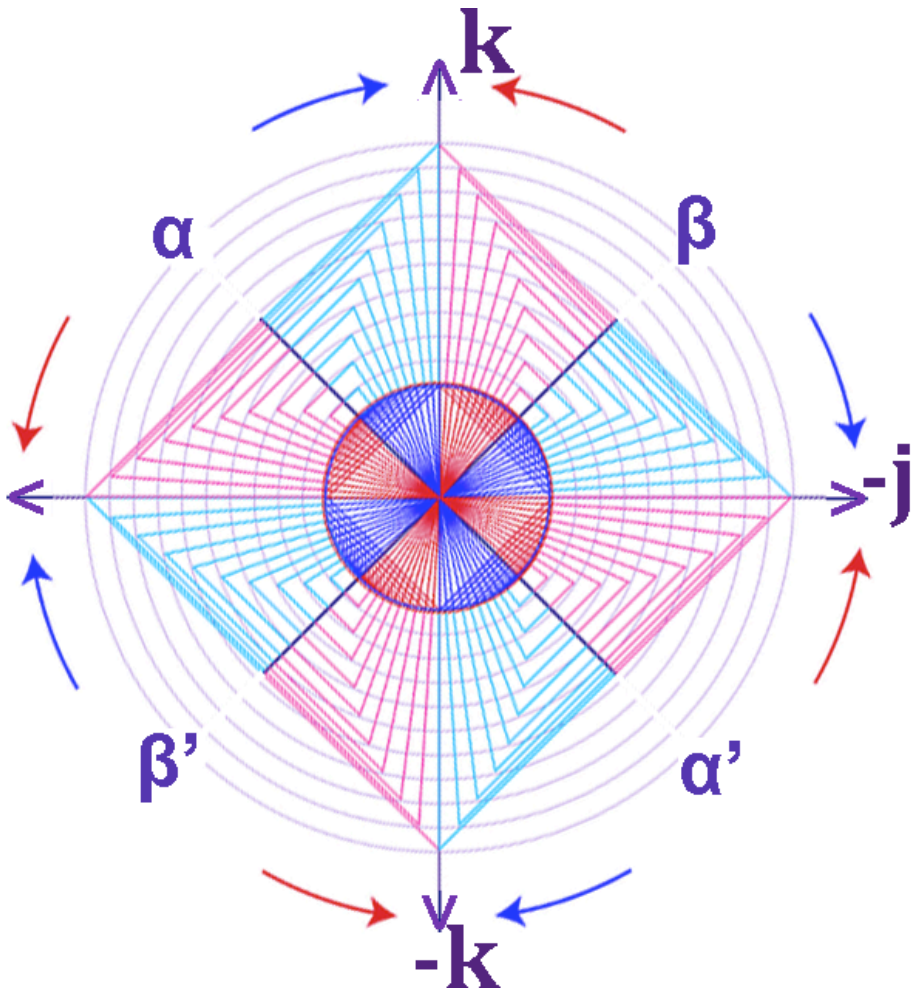
3/ rotation of the 8 new $e^{i\theta'}$

For each different degree of their rotation

the 8 Matrix $e^{i\theta}$ duplicate themselves in 8 new Son $e^{i\theta'}$

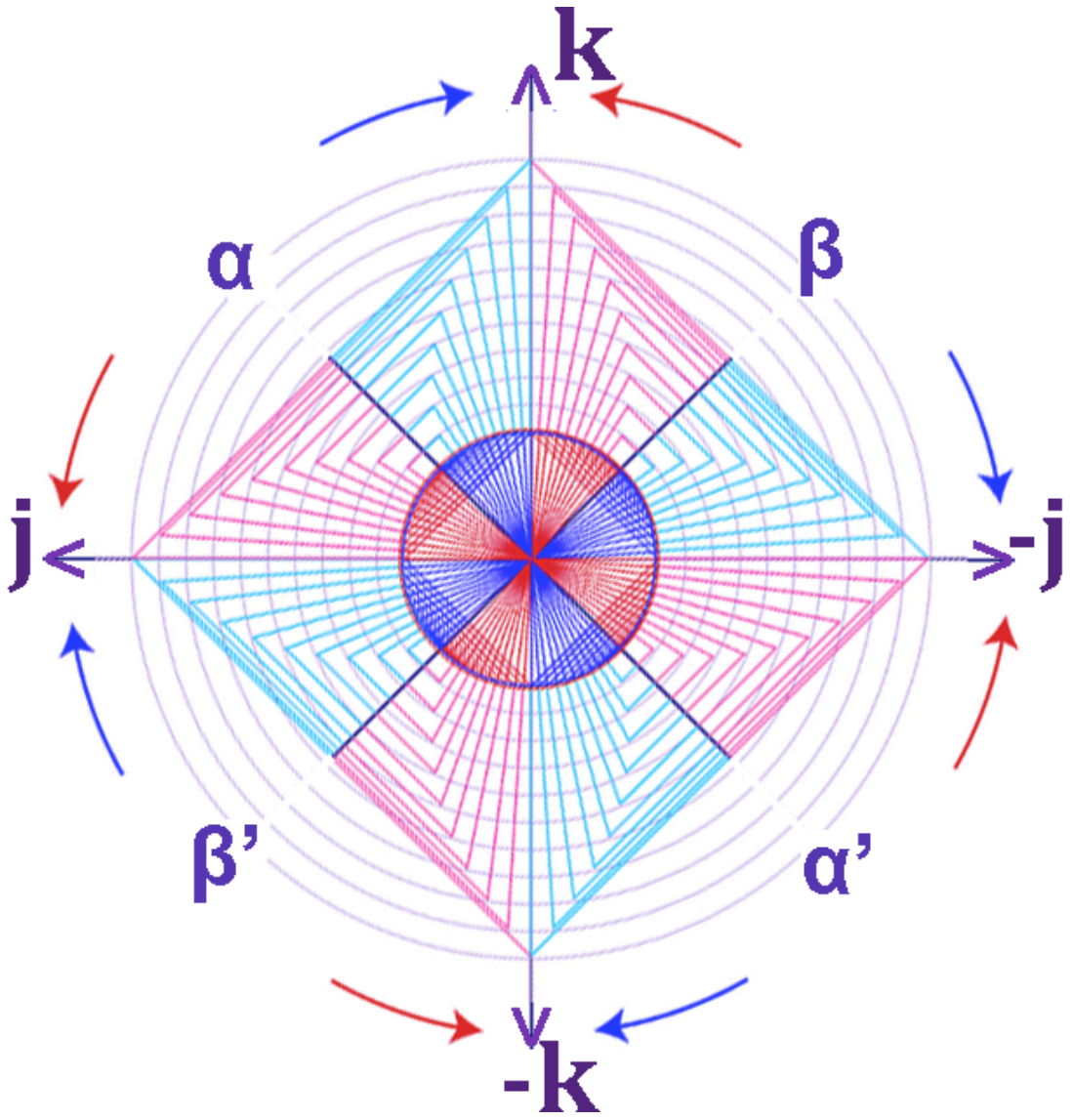


A set of 43 Son Circles
+ the first triangle Son Set
made by the 44°Matrix

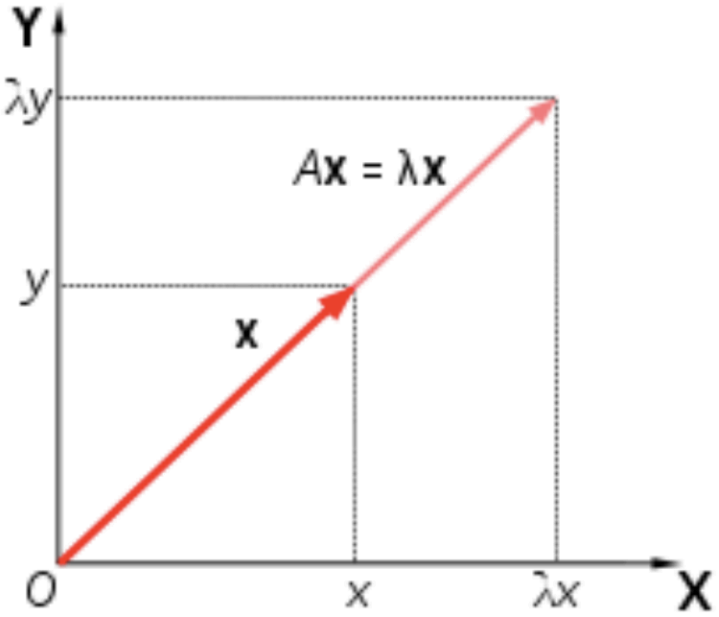


With the set of first
8 Son triangles $e^{i\theta'}$ for each Son Circle

The Son Circles do not create anything new; they only rotate.
Their speed is largely superior to the Matrix' speed rotation :
360° for each degree of the Matrix



The duplication of each Matrix $e^{i\theta}$ is provoked by the stretching of their hypotenuse by eigenvalue λ



In same direction,
the vector **x** (eiθ hypotenuse)
is stretched for the eigenvalue **λ** .

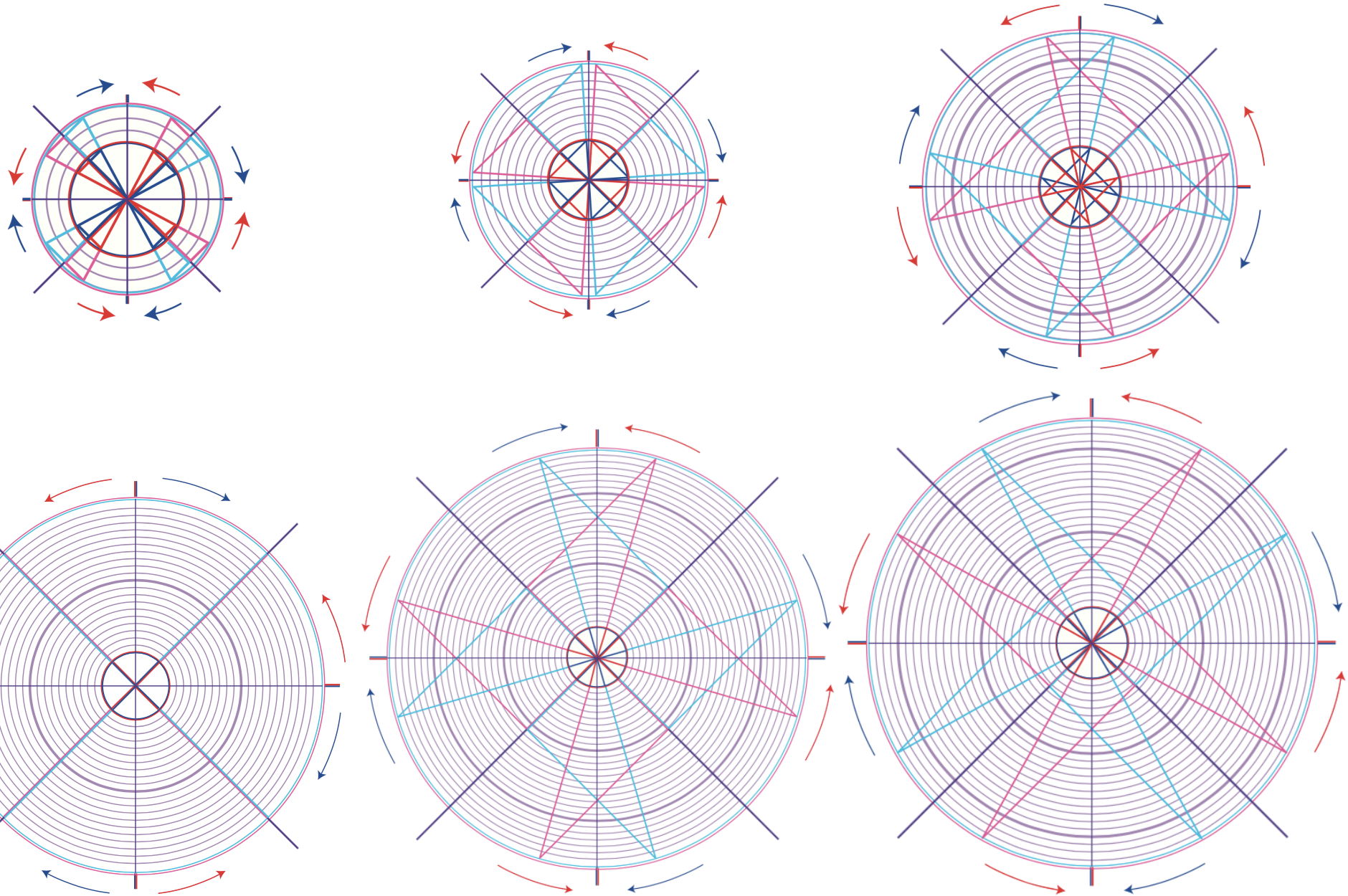
x = eigenvector for A

λ = the length of the radian for
1 degree of the Matrix Circle.

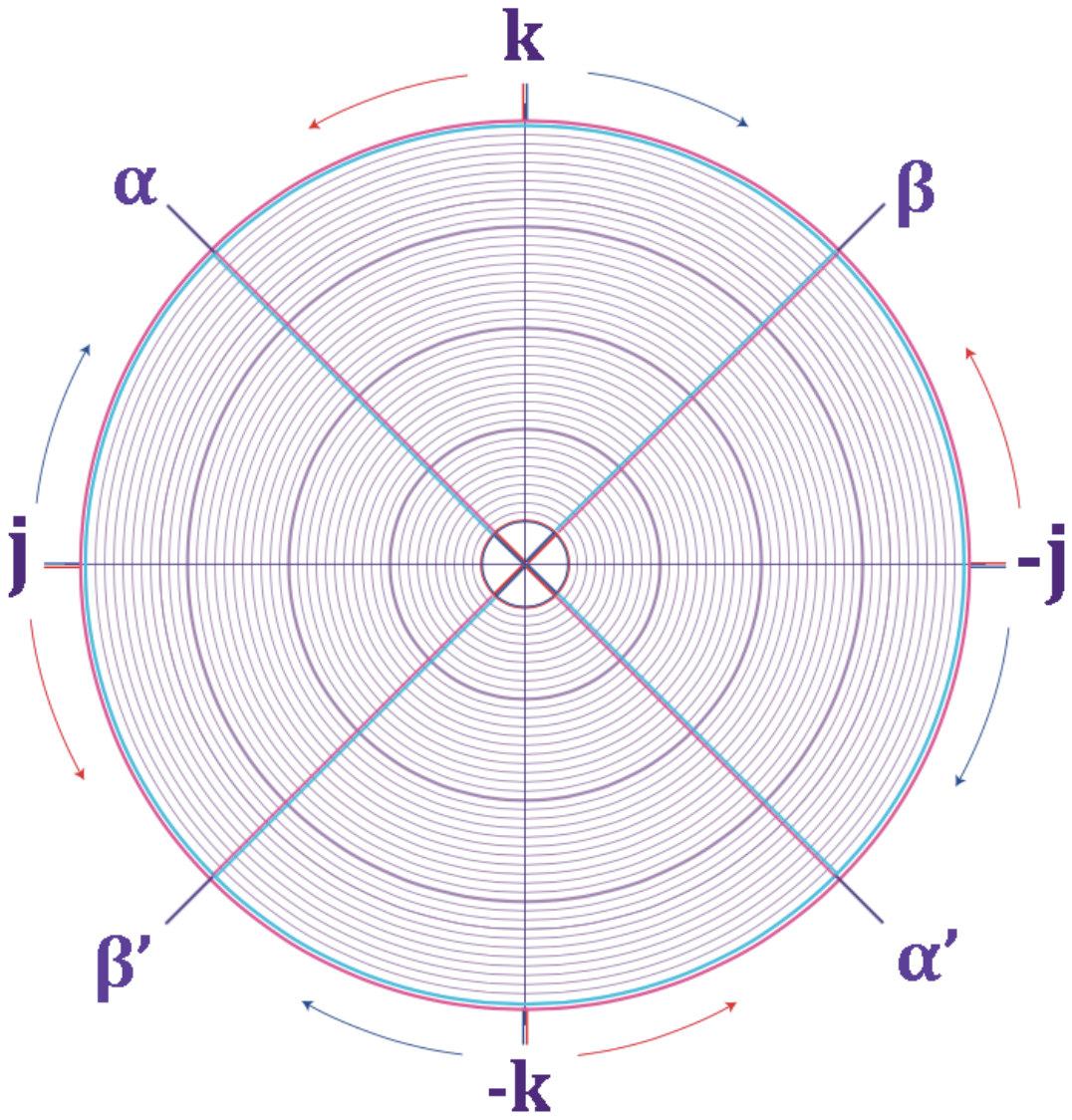
1° θ angle = 1 **λ**
2° θ angle = 2 **λ**
3° θ angle = 3 **λ**
…
n° θ angle = n **λ**

But each degree get its own hypotenuse direction

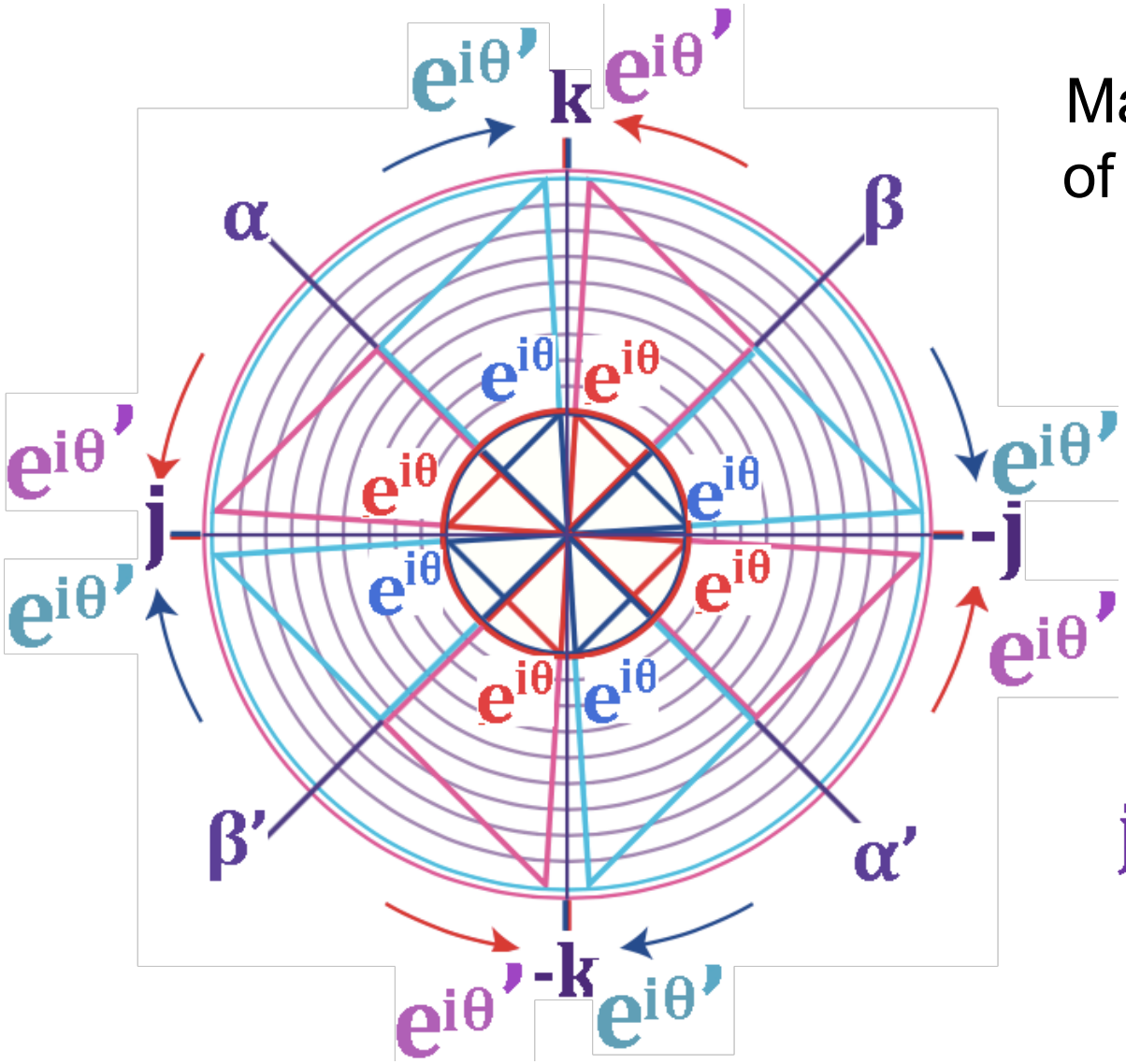
The Matrix rotation = 1 Son Circle per degree



The development of the photon's wave is done through cycles of 4 sections of 45 Son Circles



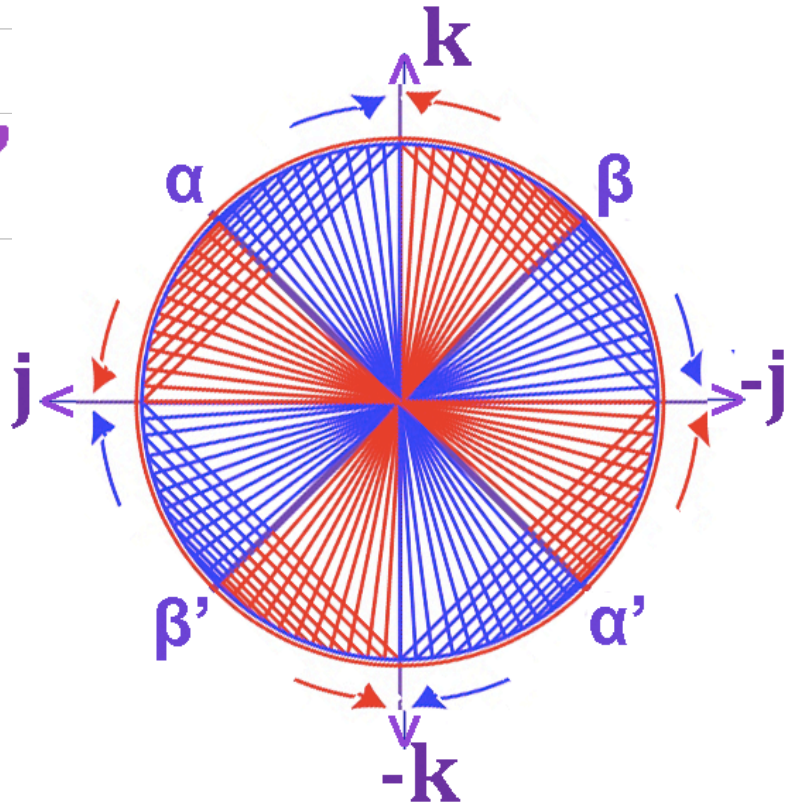
The 1st section of the 45 Son Circles (0° to 45°)



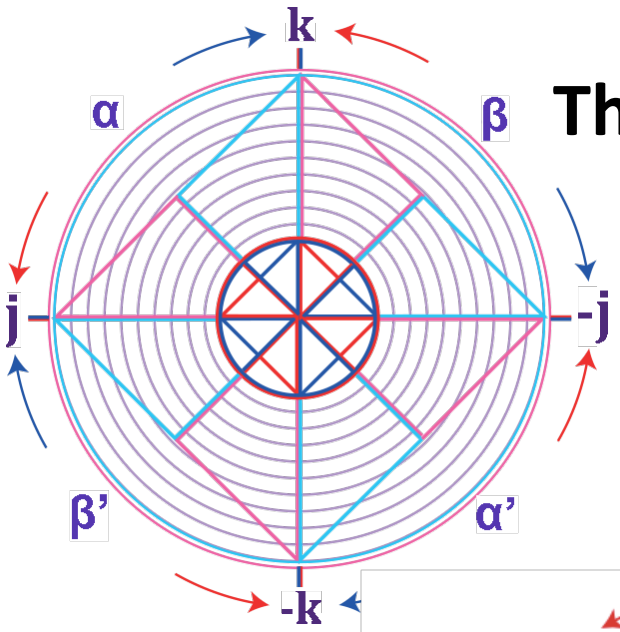
above the 44th°

Matrix with different value of θ angle in superposition

Matrix geometry = short sine set

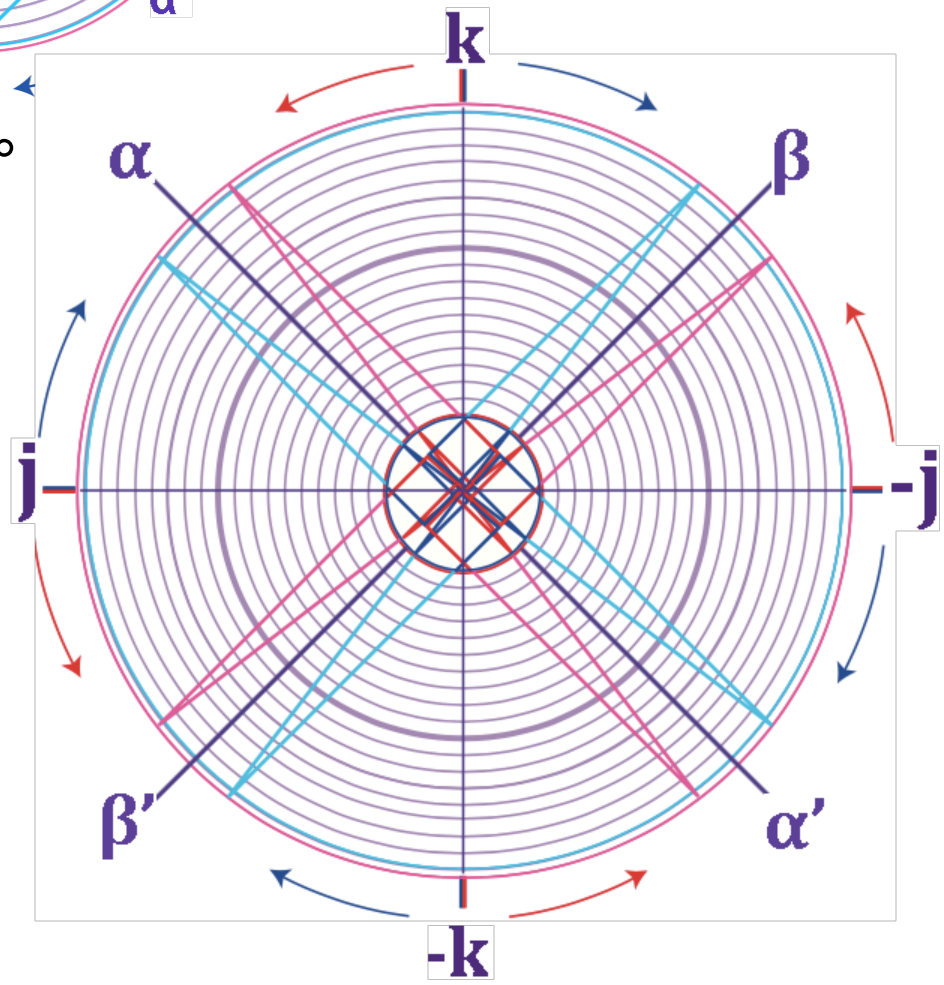


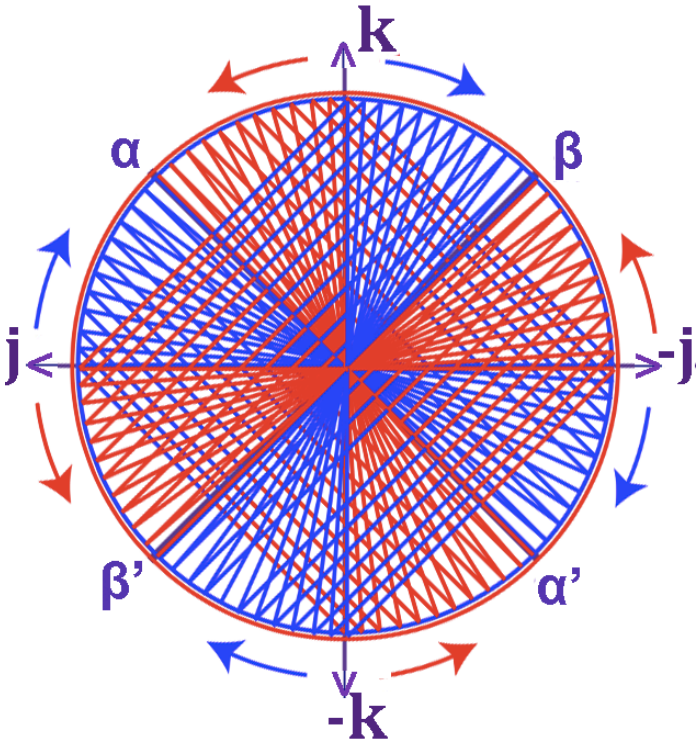
The 2nd section of 45 Son Circles (45° to 90°)



Matrix geometry = long sine set
+ crossing directionality

above: 45°

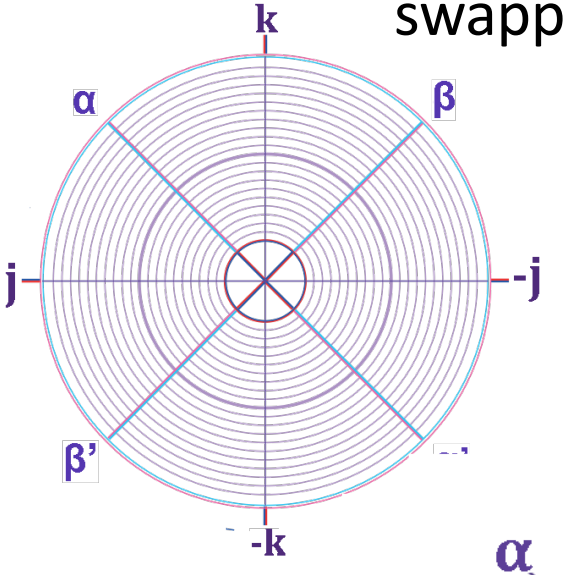




here: 85°

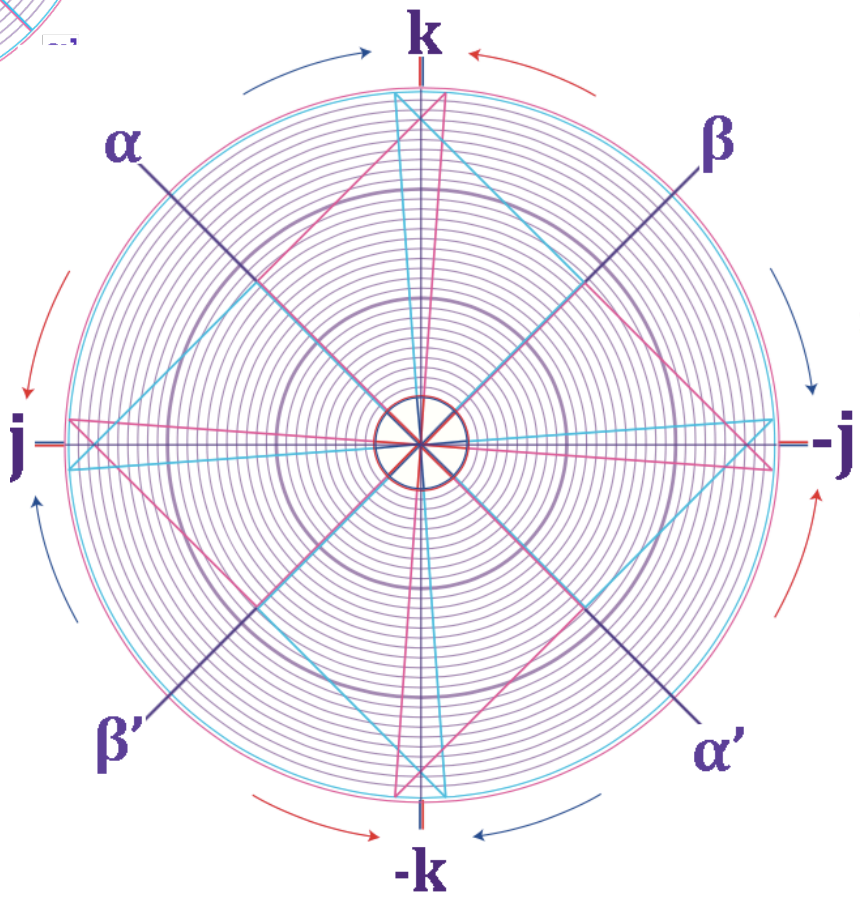
The 3rd section of 45 Son Circles (90° to 135°)

swapping of poles with a common axis for each pair on 90°

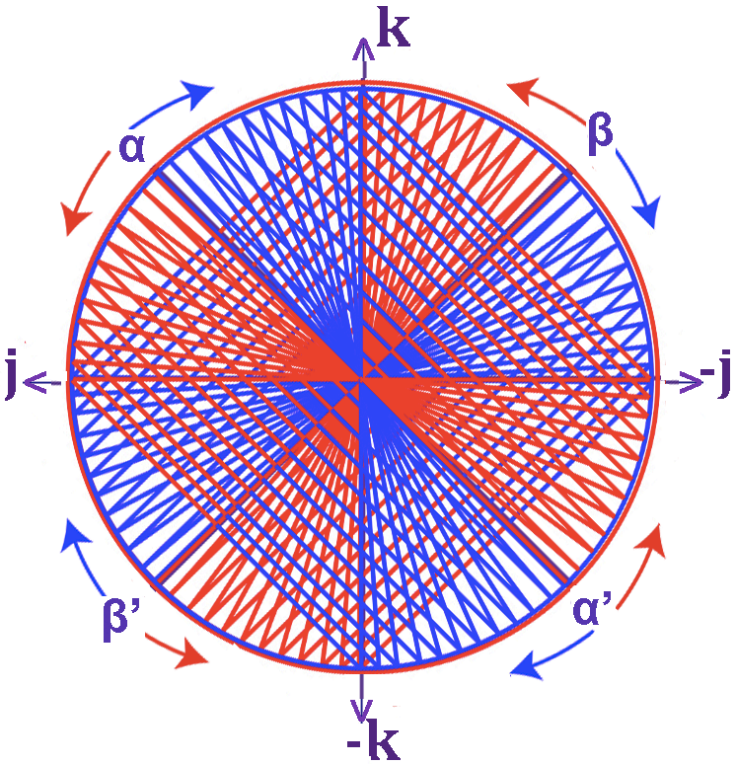


above: 90°

Matrix geometry =
long sine Set + crossing directionality

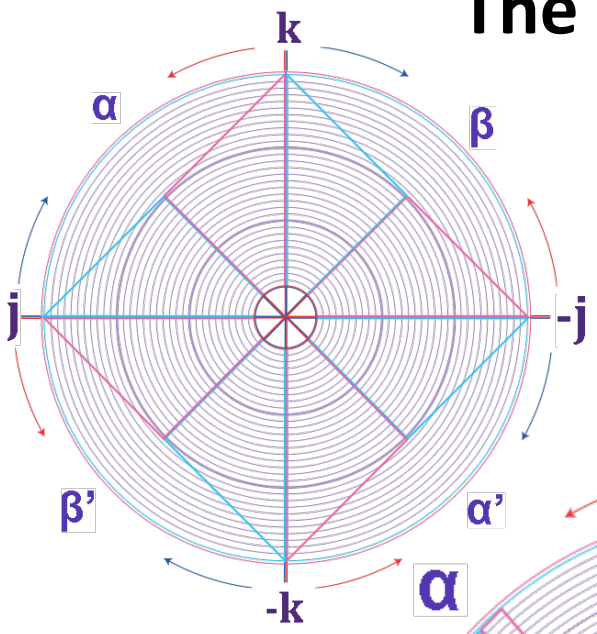


here 134°

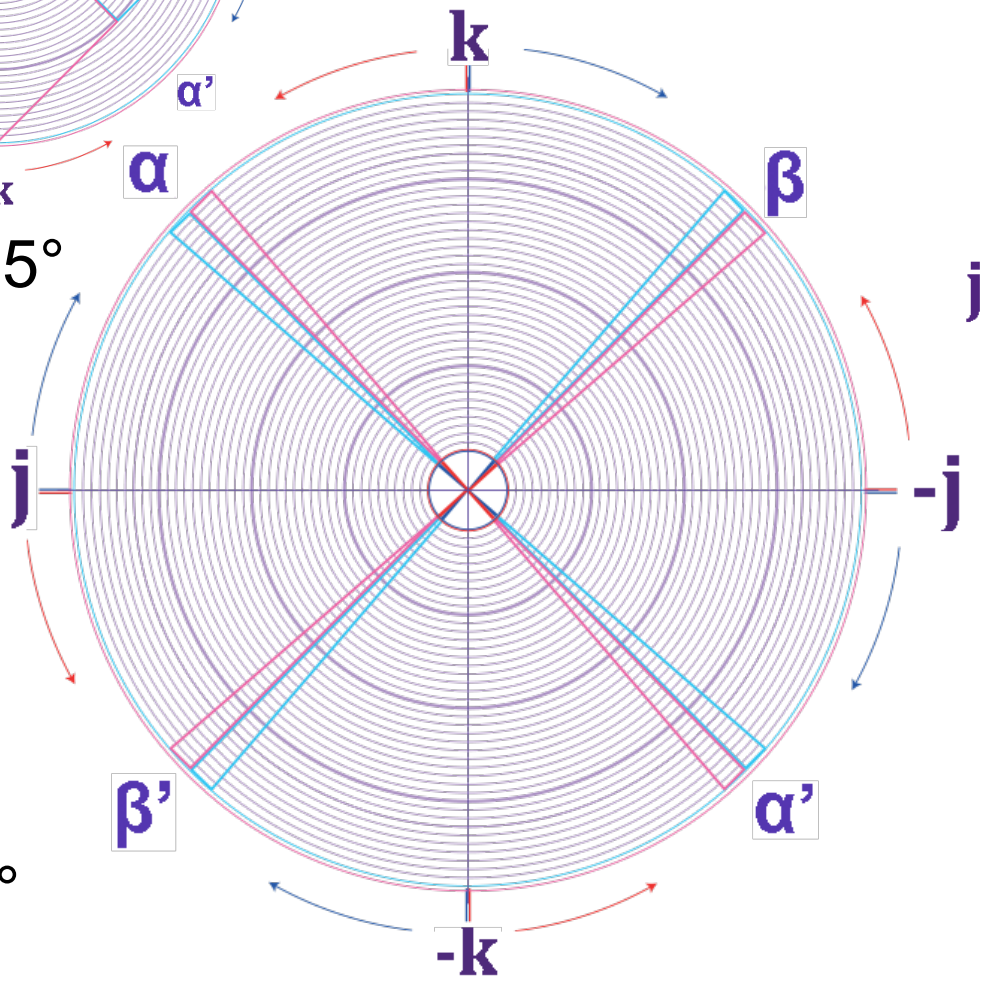


The 4th section of 45 Son Circles (135° to 179°)

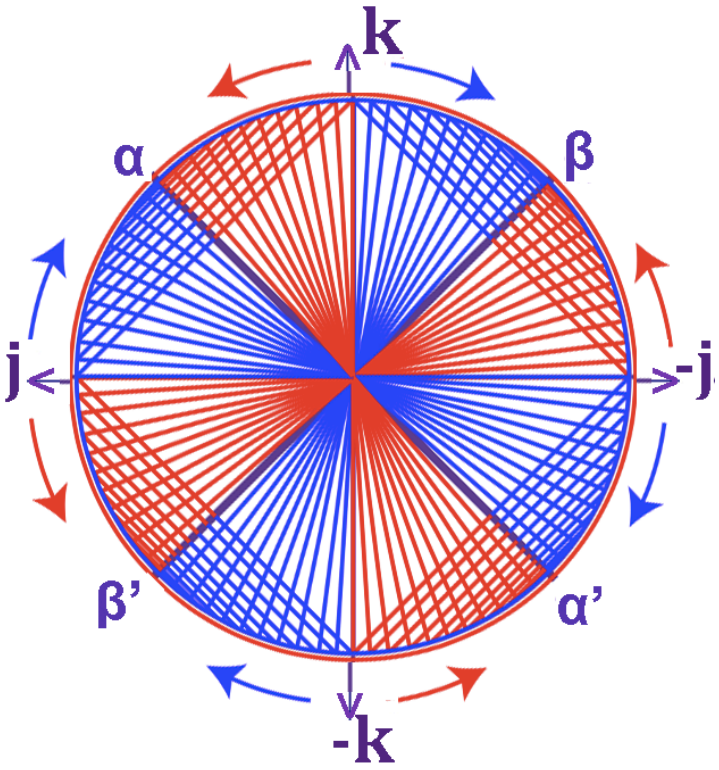
Matrix geometry = short sine set



above: 135°



here 179°

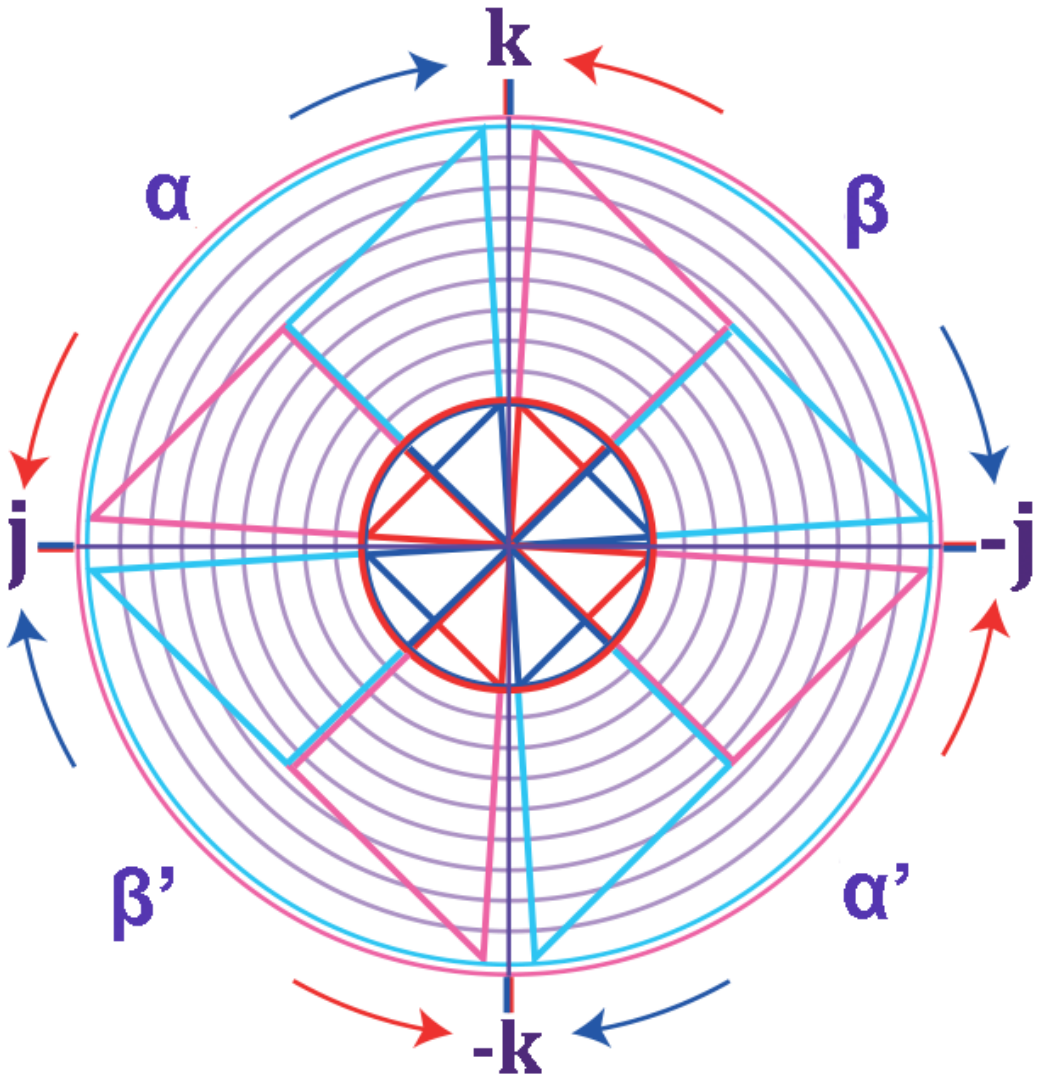


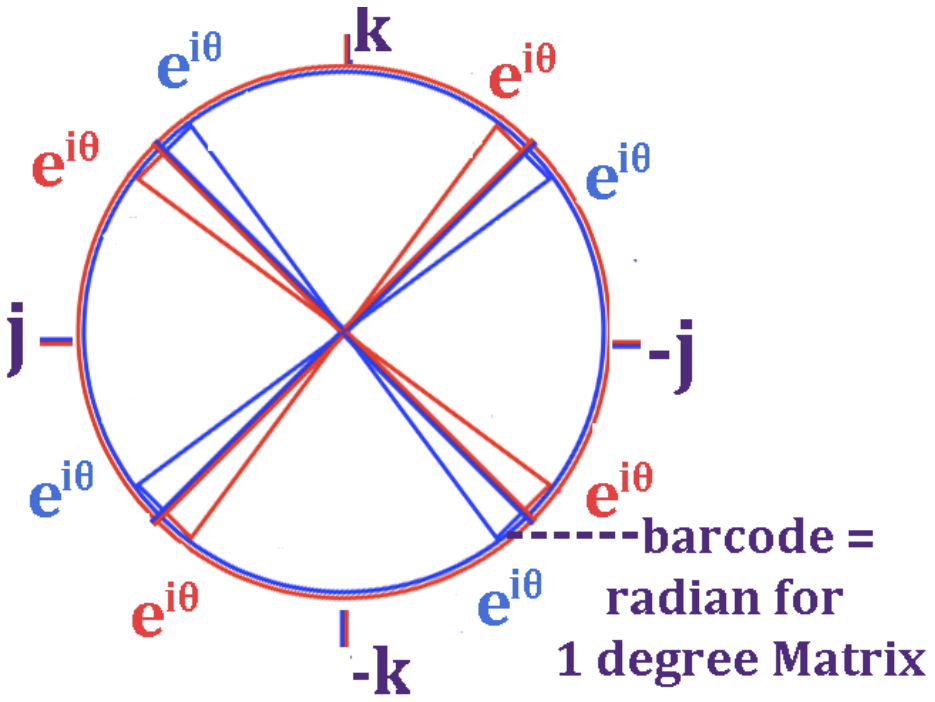
The Matrix shapes the distance between its Son Circles

This distance is identical and unique to a Matrix

= its barcode

Each Matrix = its own barcode



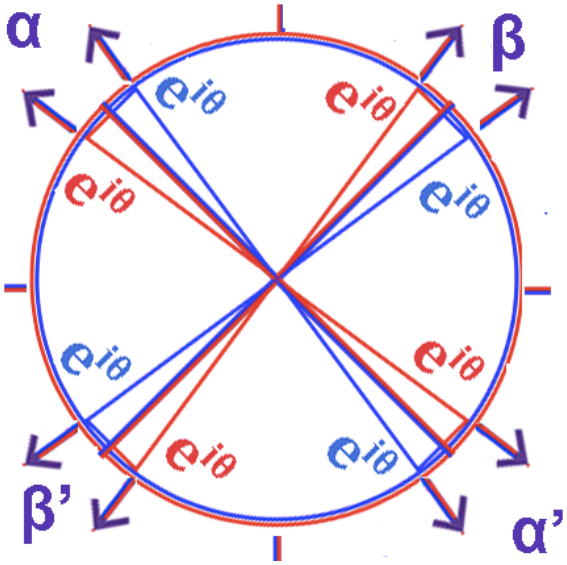


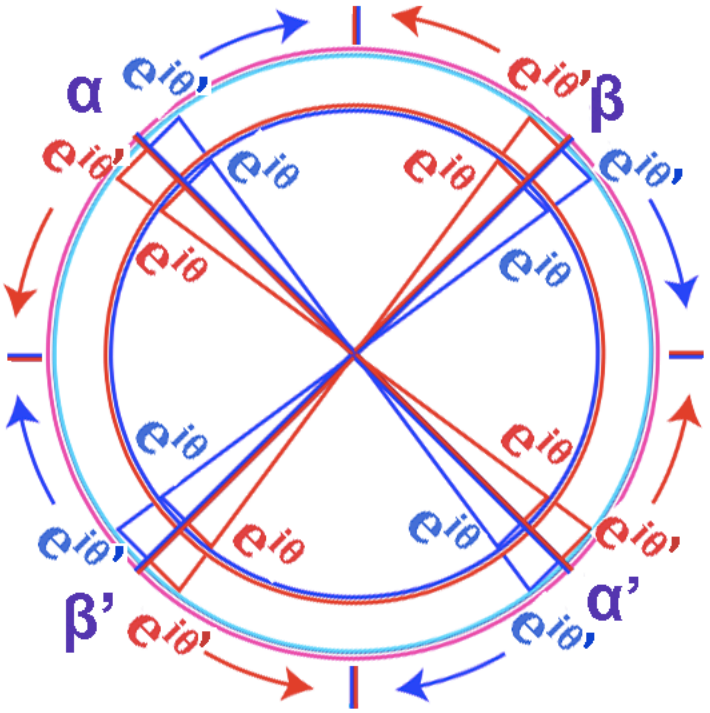
a barcode = an eigenvalue λ

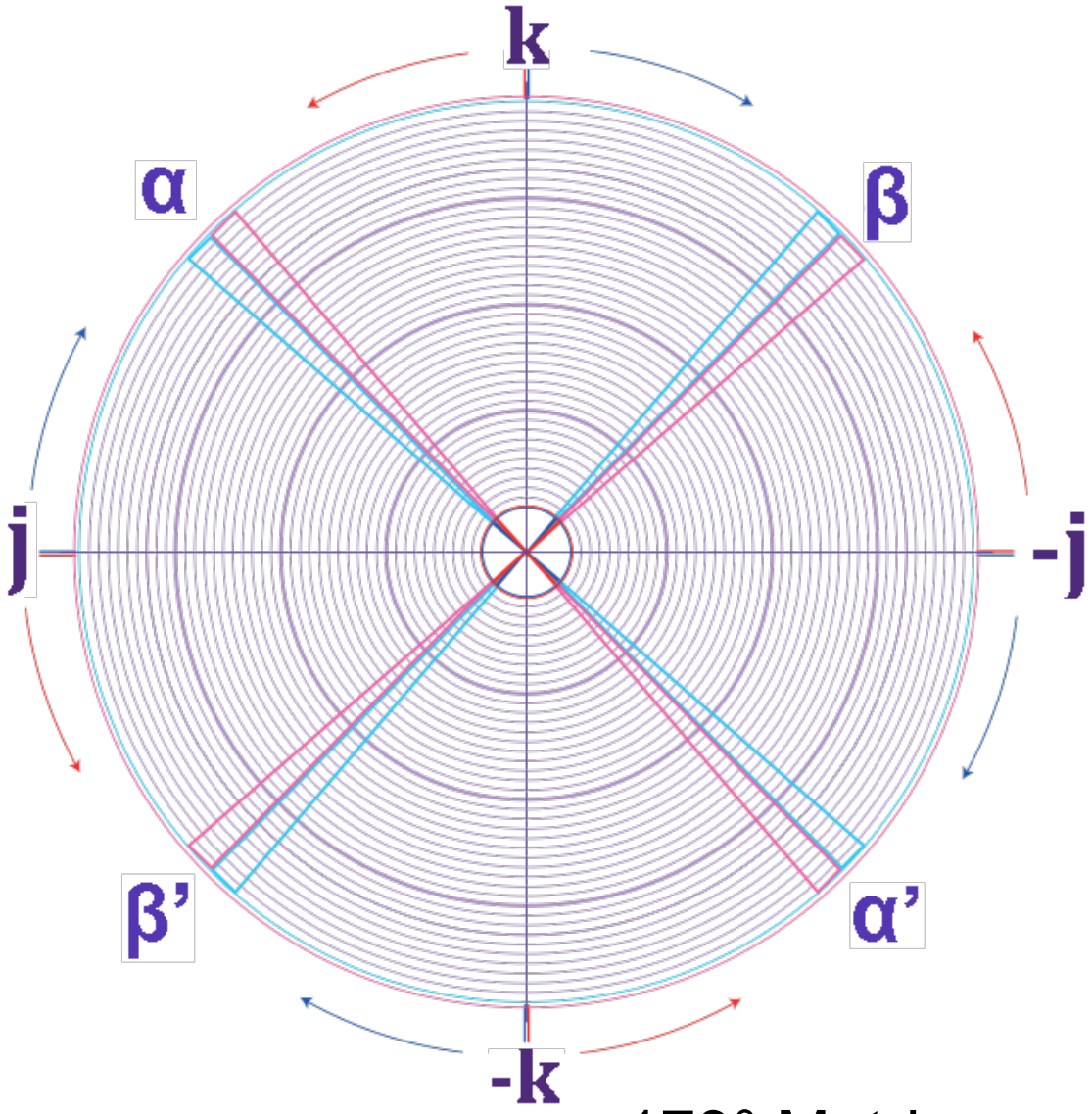
it determines wavelength and frequency

1 Cycle = 1 phase = 4 half curves

Matrix and Son Circles



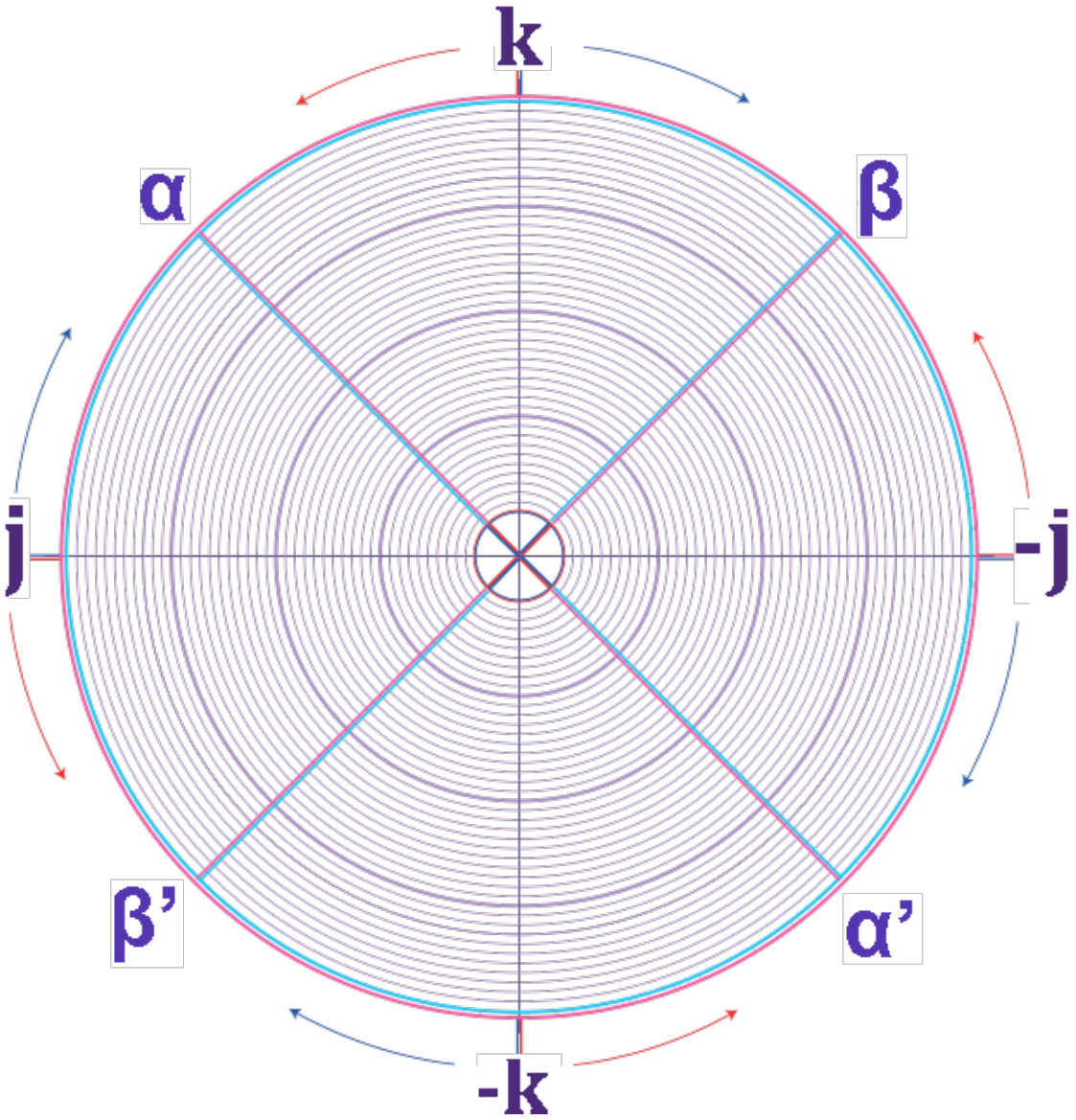




1°= 1 Son Circle

179° Matrix =
179 Son Circles

Creation of a new Matrix

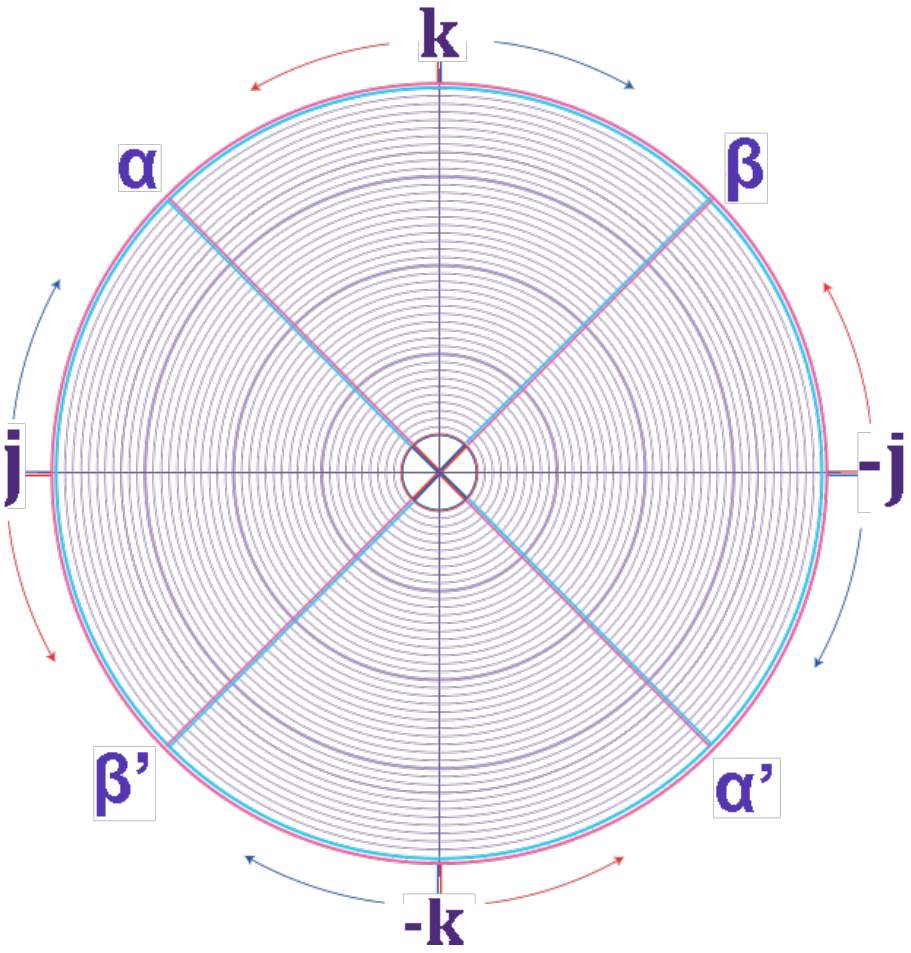


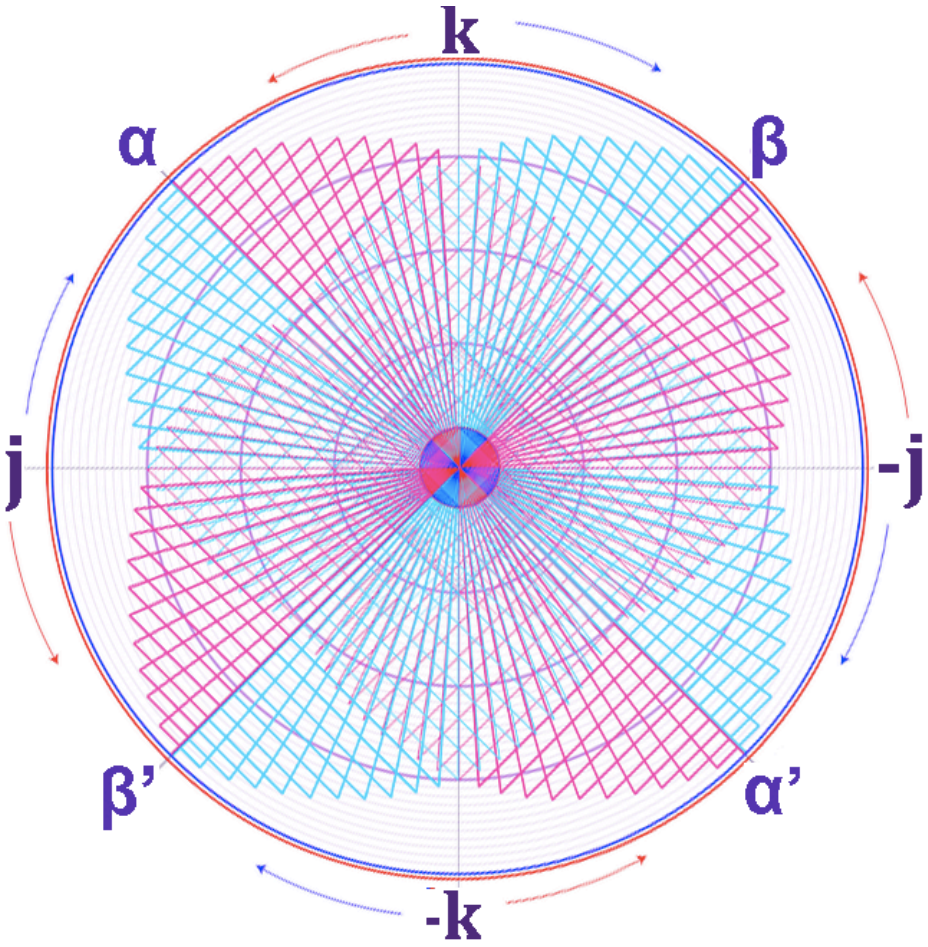
The extension of 180 λ for the 180° θ angle costs 1 quantum of energy to a Matrix

At the end of its first Son Cycle, a Matrix creates a duplicate of itself but with an energy lower about 1 quantum

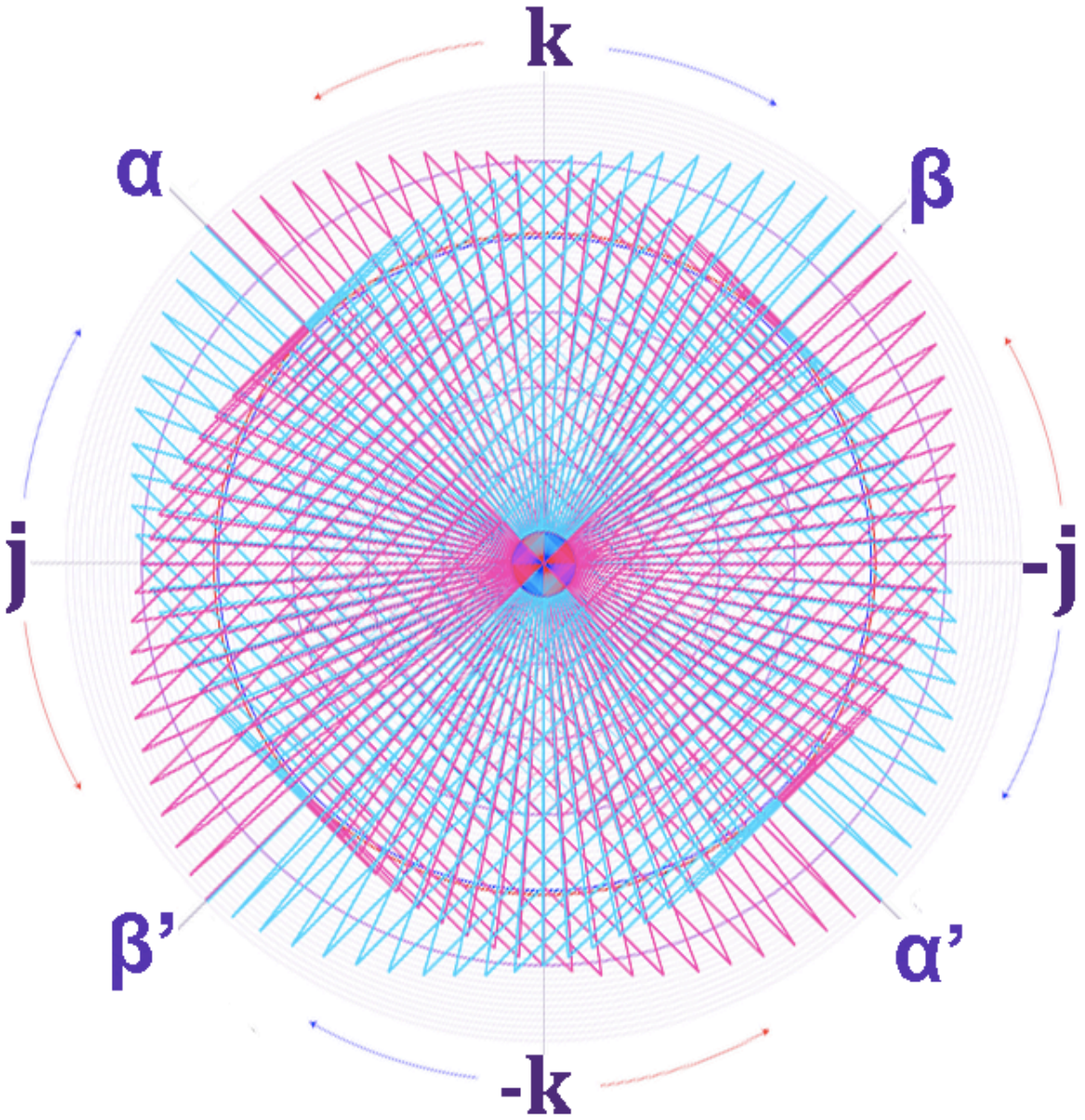
.

The photon's wave with 2 Matrix Circles
+ all the first sets of 8 $e^{i\theta}$ triangles in superposition
for each Son Circle (on the right)





Son Cycles in superposition
as created by many Matrices simultaneously



The new Matrix produces a Cycle of 179 Son Circles

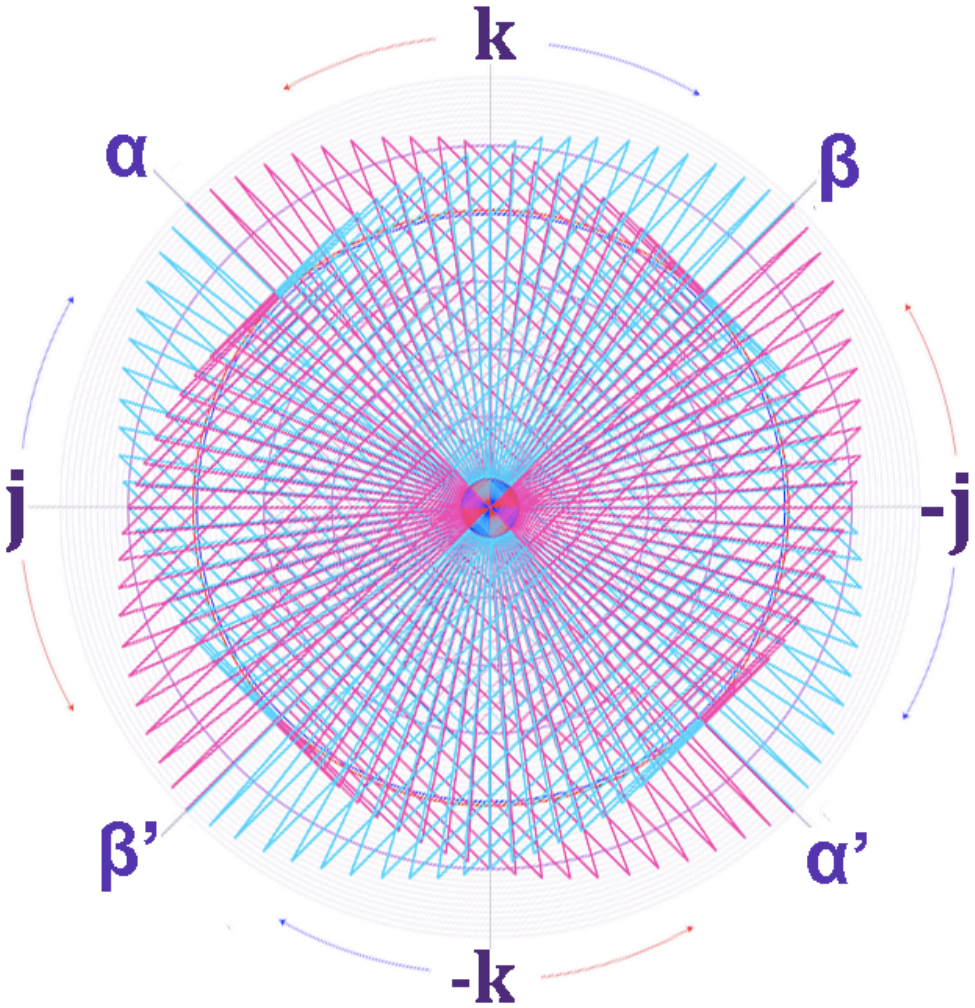
This new Son Cycle belongs simultaneously to both Matrices (1 and 2)

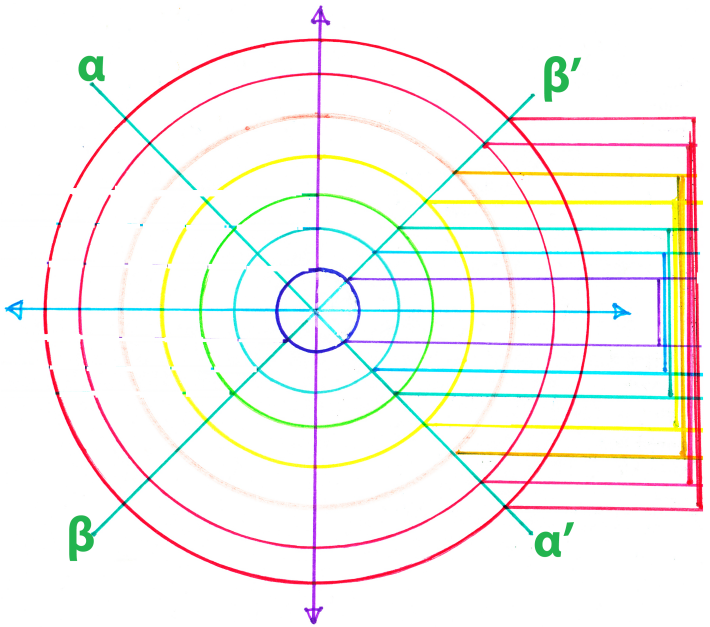
At the end of its Cycle the 2nd Matrix creates a 3th Matrix, and so on…

A Son Cycle belongs at the same time either to the 1st, the 2nd, the 3rd Matrices and so on…

For the photon's wave
each Son Cycle is in superposed state
= white color

The electromagnetic spectrum is the property of a photon's wave

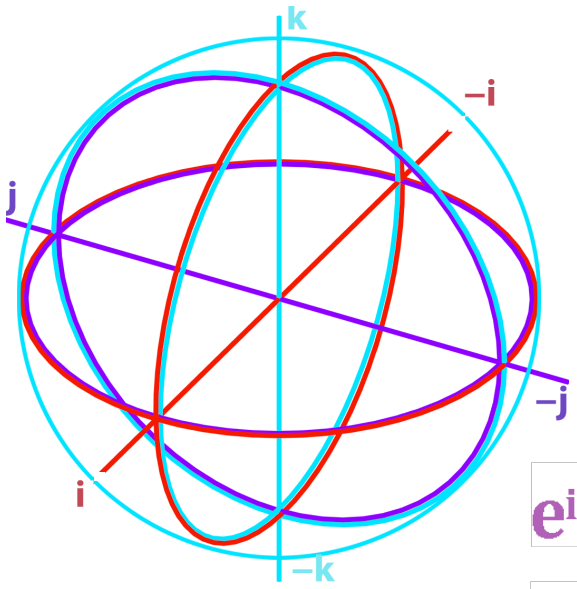


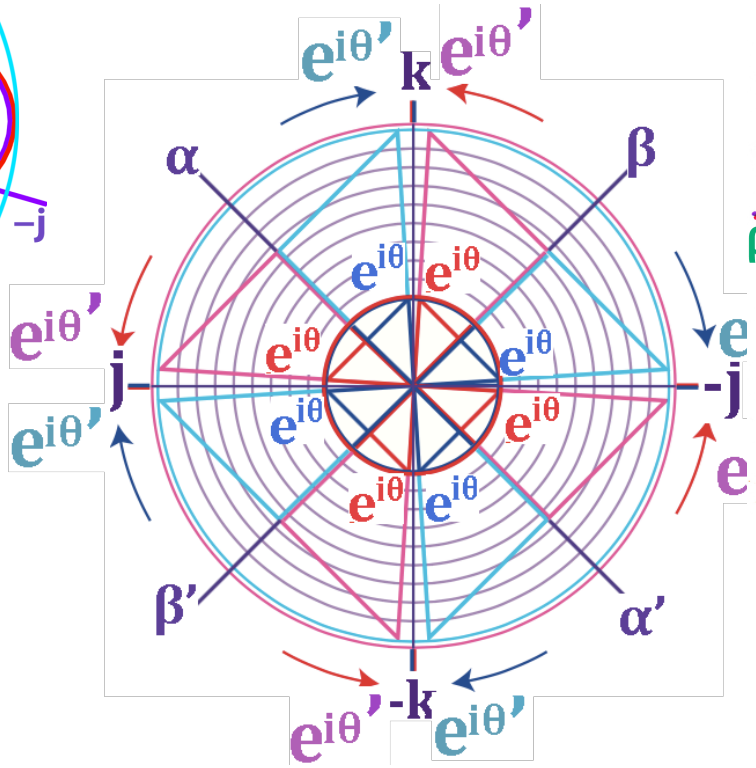


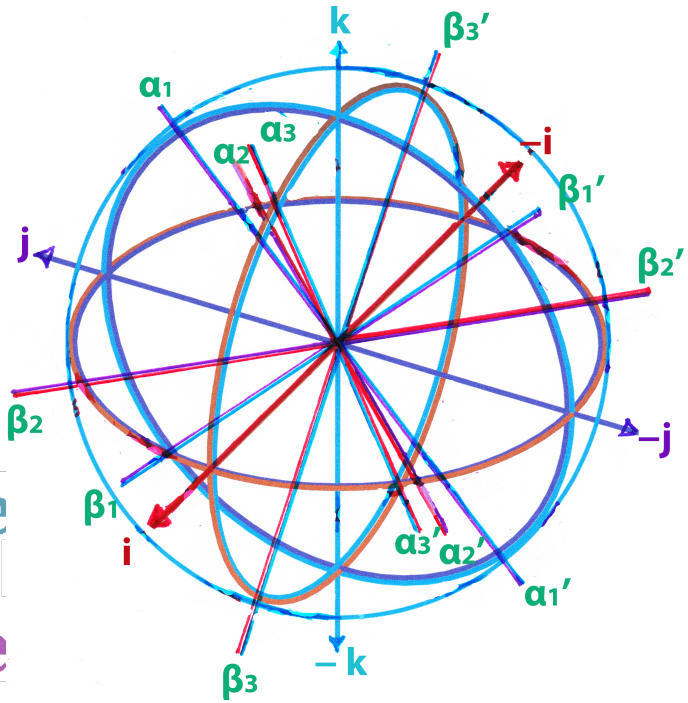
The three-dimensional space

introduces the magnetic pole to the previous electric one
by pairs of perpendicular circles in opposite rotation
Each circle is in double way rotation for their 2 sets of 4 $e^{i\theta}$

in 3D = 1 Matrix Set = 3 Matrix Circles
with the same geometry and Son Circles production





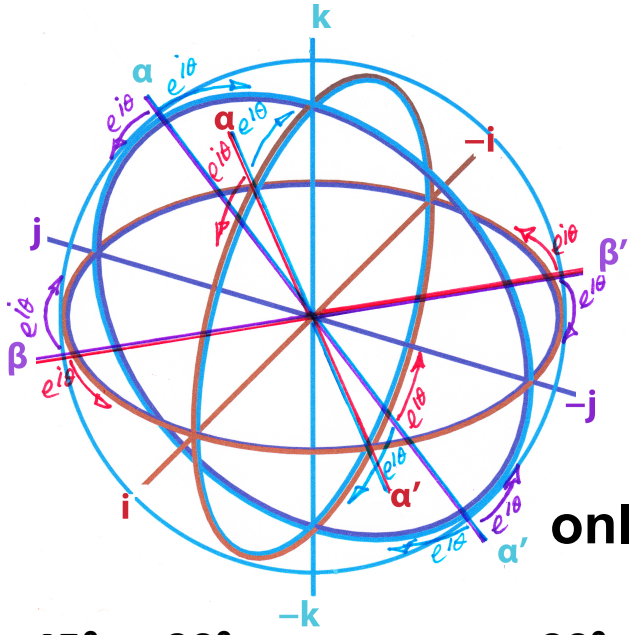


$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

An equivalence for the change of sign in Maxwell's wave

$$\vec{\mathrm{rot}}(\vec{E}) = -\frac{\partial \vec{B}}{\partial t}$$

(Maxwell-Faraday)

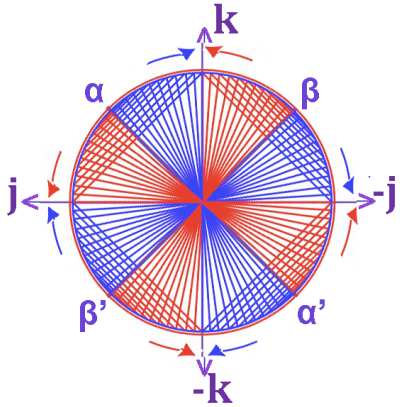


$$\vec{\mathrm{rot}}(\vec{B}) = \mu_0 \vec{J} + \frac{1}{c^2}\frac{\partial \vec{E}}{\partial t}$$

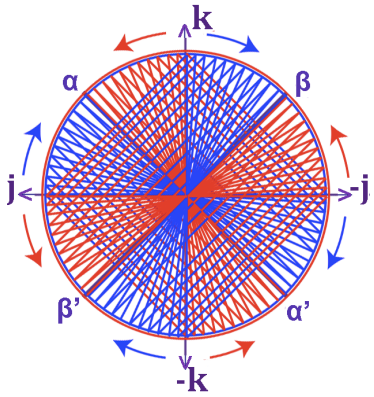
(Maxwell-Ampère)

only 6 pairs of $e^{i\theta}$ to ease

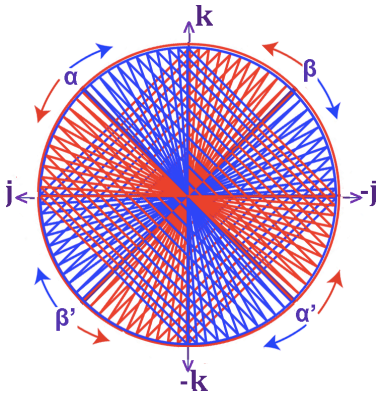
0° to 45°
1st section of 45 Son Circles



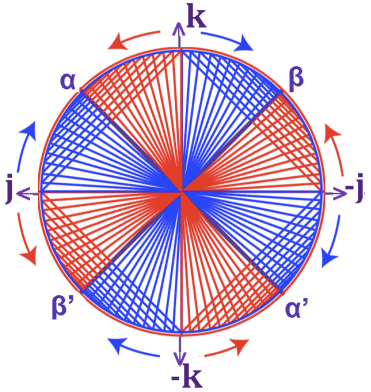
45° to 90°
2nd section of 45



90° to 45°
3rd section of 45



45° to 0°
4th section of 45 Son Circles

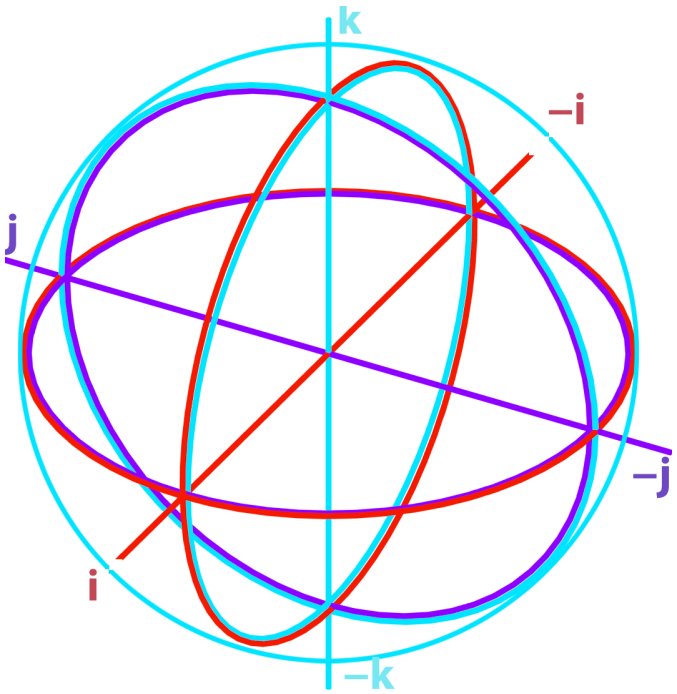


The Fiber Sphere

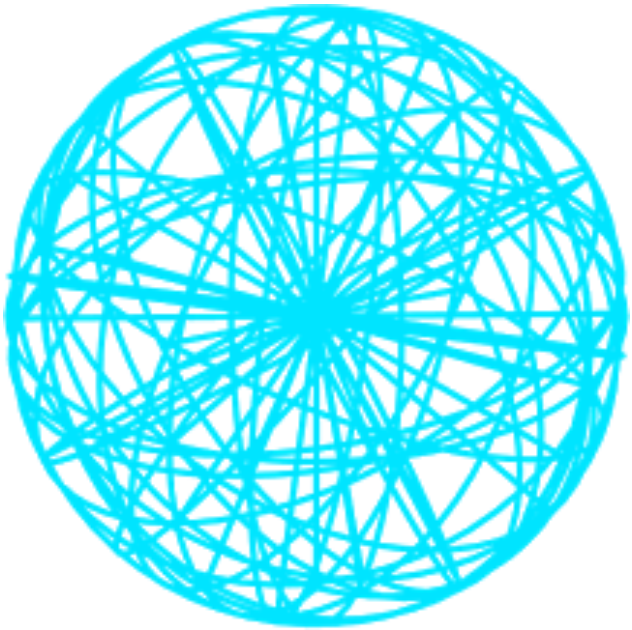
1 Matrix Set = 1 orientation set = 1 Fiber
a Fiber can get any possible orientation in space = the base

The model Fiber X the base = the total space = a Fiber Sphere

The model Matrix Fiber



The Fiber Sphere

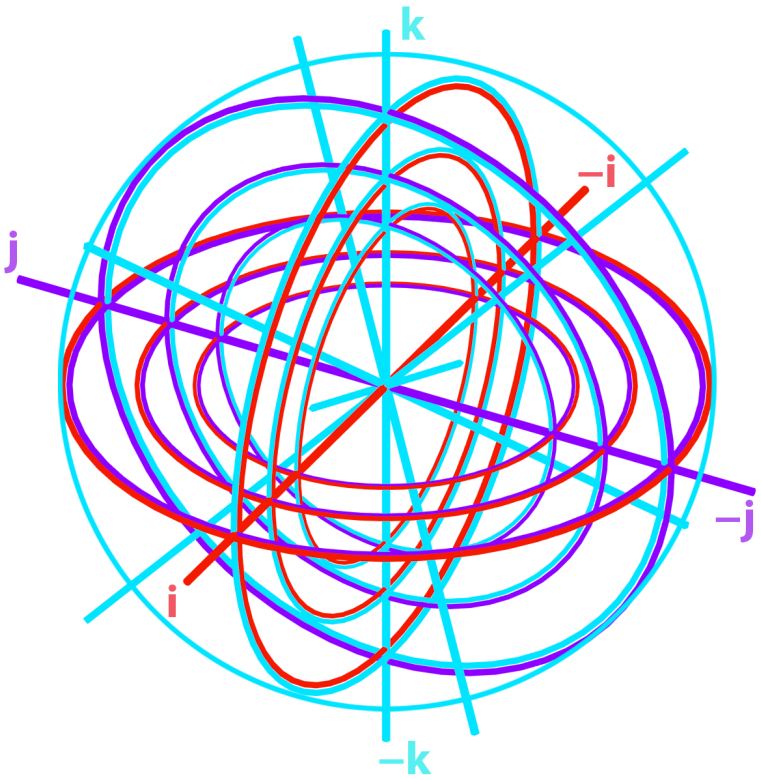


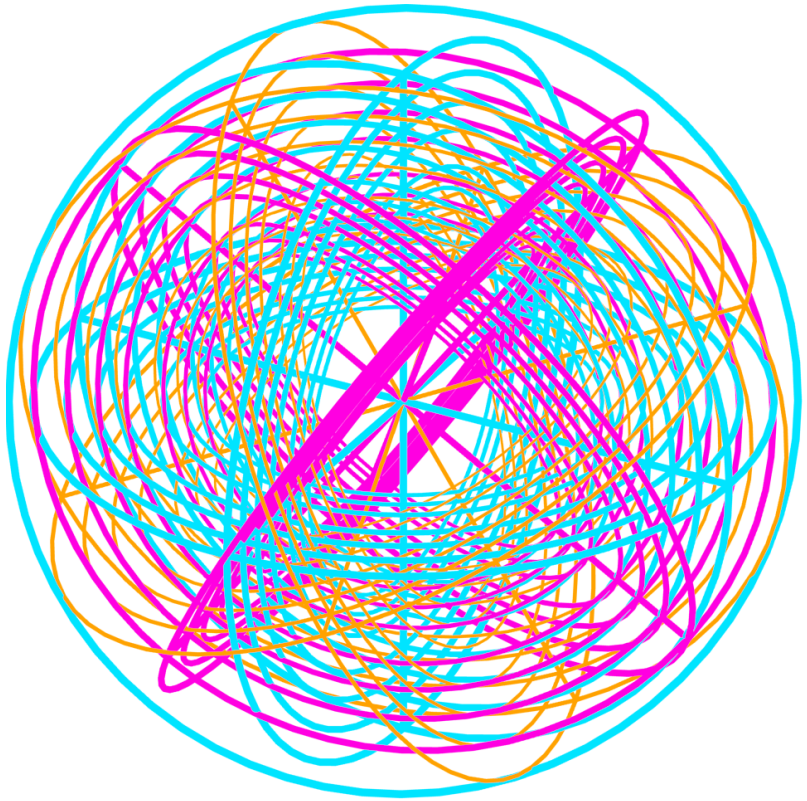
A photon's wave 3D evolution

due to opposite forces added to each degree of a Matrix:

Matrix Circle creates concentric Son Circles
Matrix Fiber creates concentric Son Fibers
Matrix Sphere creates concentric Son Spheres

Here each Sphere = a few circles only to avoid saturation





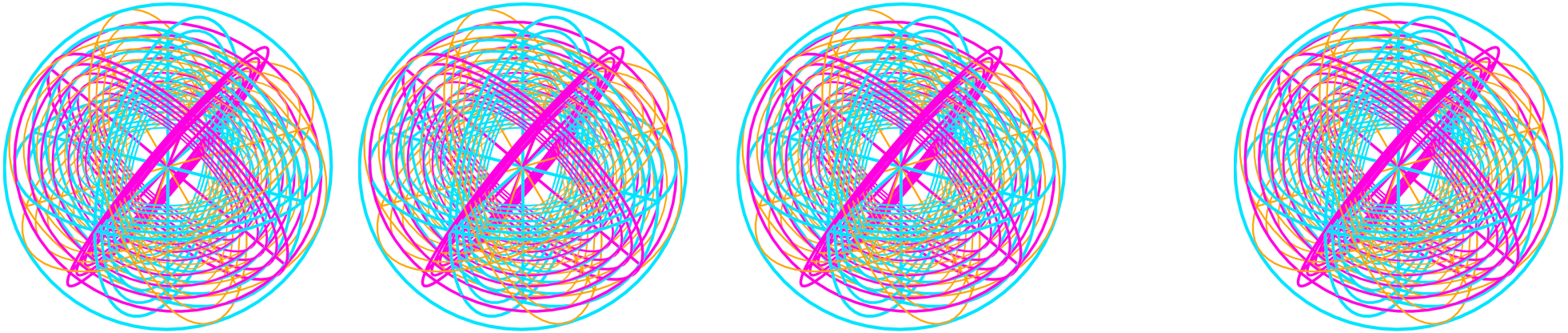
A collective electromagnetic wave

=

aggregate sum of its units, photons' waves

=

a collective wave



+ + + n =

Photon/wave A + Photon/wave B + Photon/wave C + n = an electromagnetic Wave

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

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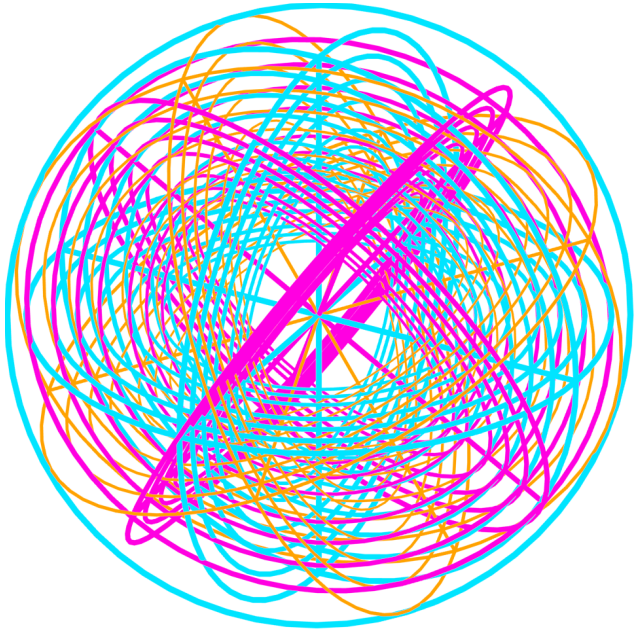
$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}.$$

In perspective with Schrödinger equation in 3D

Dependent of time

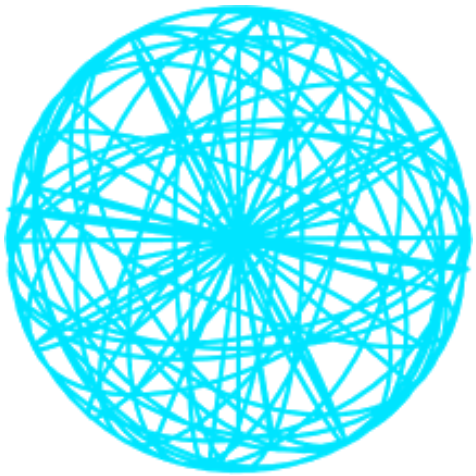
$$H\,|\psi(t)\rangle = i\hbar\frac{\partial}{\partial t}\,|\psi(t)\rangle$$



Multiple Son Spheres
= a continuum of time

But Photon has no mass
and no Hamiltonian

1 Sphere = a dot of time



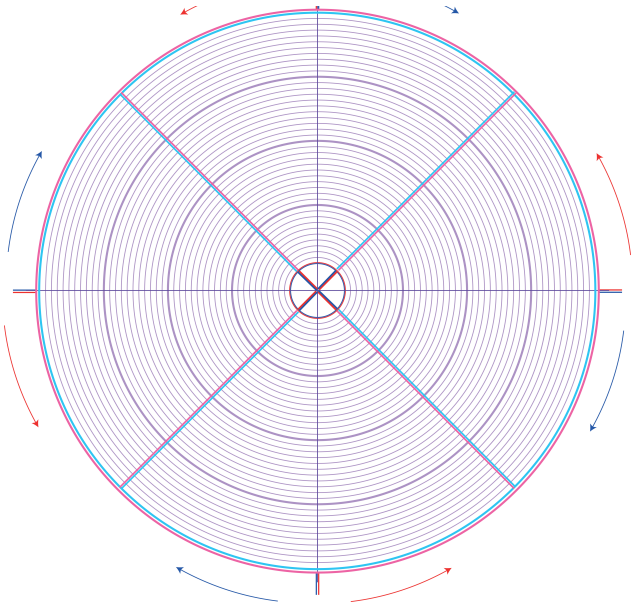
$$H\,\psi(x) = E\,\psi(x)$$

Independent of time

In perspective with Schrödinger equation in 2D

Dependent of time

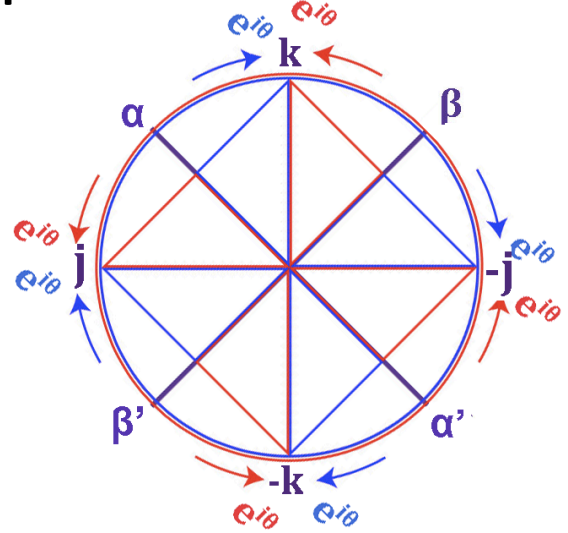
$$H\,|\psi(t)\rangle = i\hbar\frac{\partial}{\partial t}\,|\psi(t)\rangle$$



Multiple Son Circles
= a continuum of time

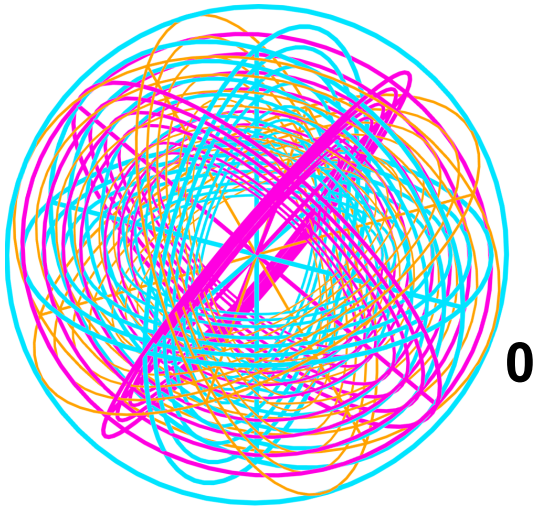
But Photon has no mass
and no Hamiltonian

1 unique Son Circle = a dot of time



$$H\,\psi(x) = E\,\psi(x)$$

Independent of the flow of time



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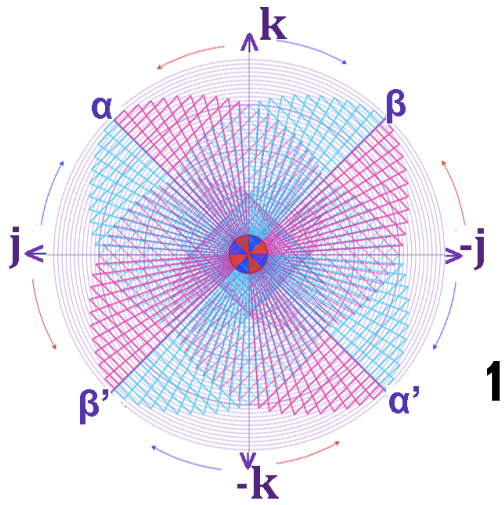
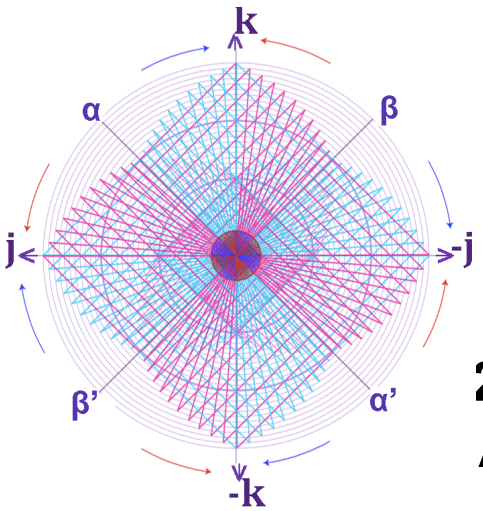
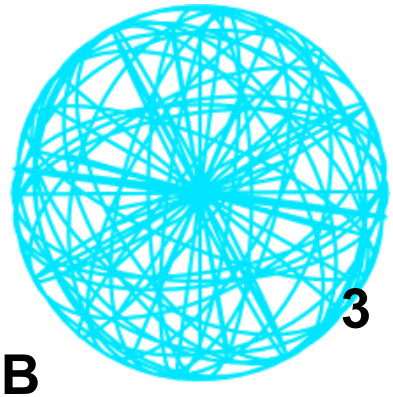


1



2

A B



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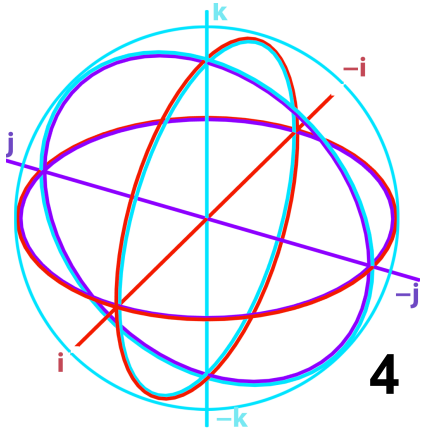

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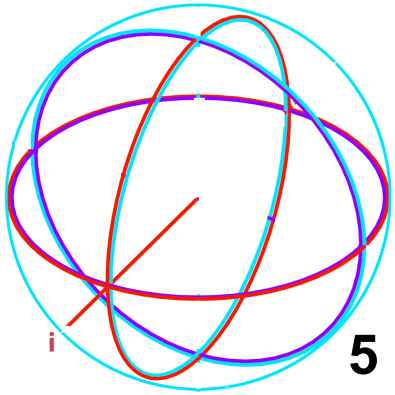

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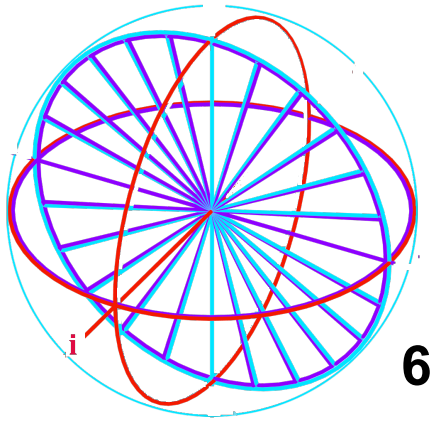

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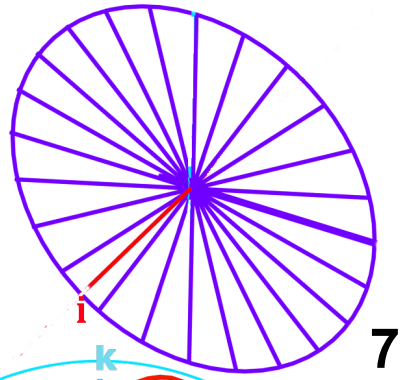

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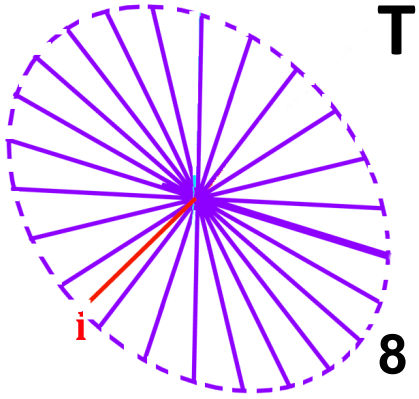
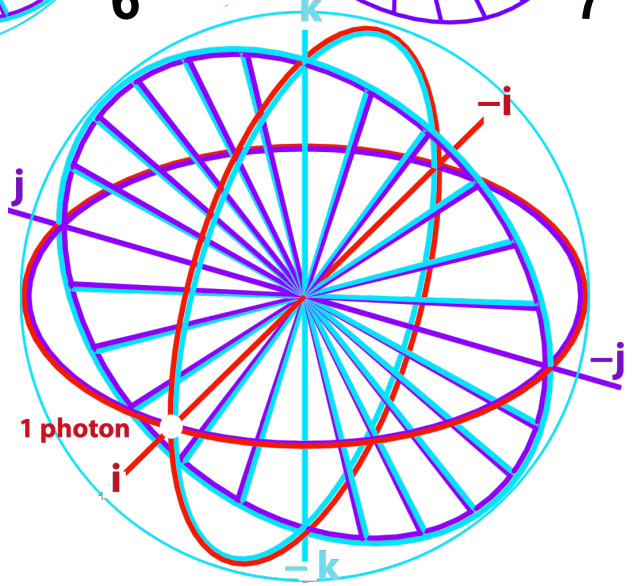


8

The collapse wave in 8 steps

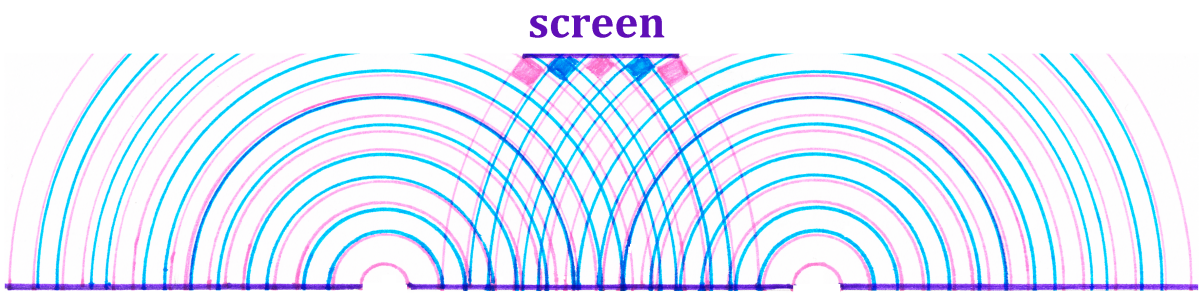
Around this dot the Fiber is
half virtual and the Sphere is virtual →

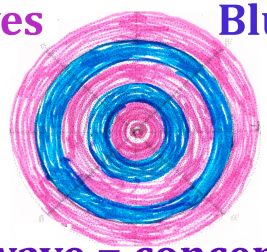


The interference pattern

Geometry collective wave = Geometry Photon's wave

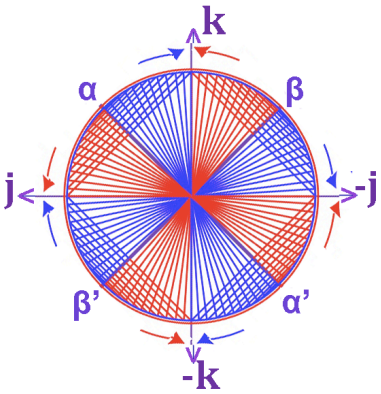
=> no difference if sent simultaneously or one by one



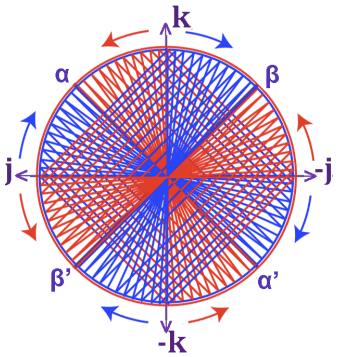


Photon's wave = concentric Spheres

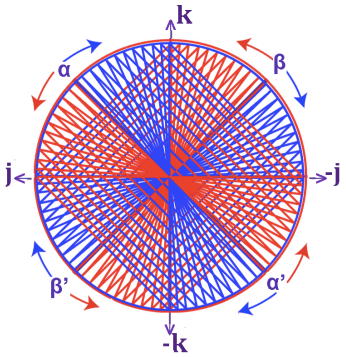
short sine set



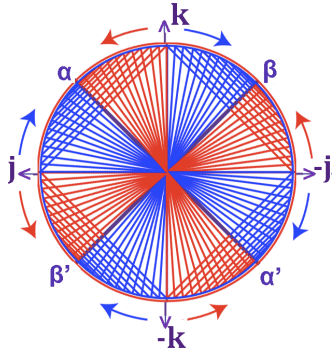
long sine set



long sine set



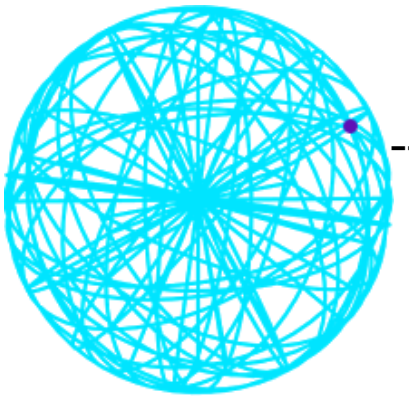
Short sine set



The photon's wave and the collective wave echo each other

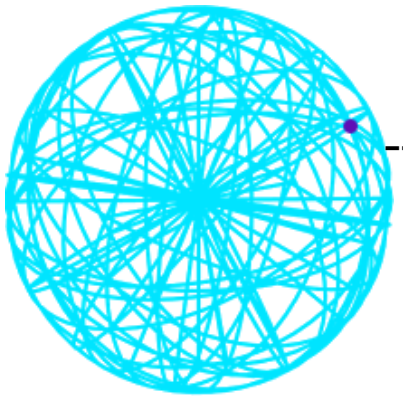
in regard to their actualized axis or dot photon

1 unit = 1 photon's wave



---- Potentially Actualised spot

Collective wave



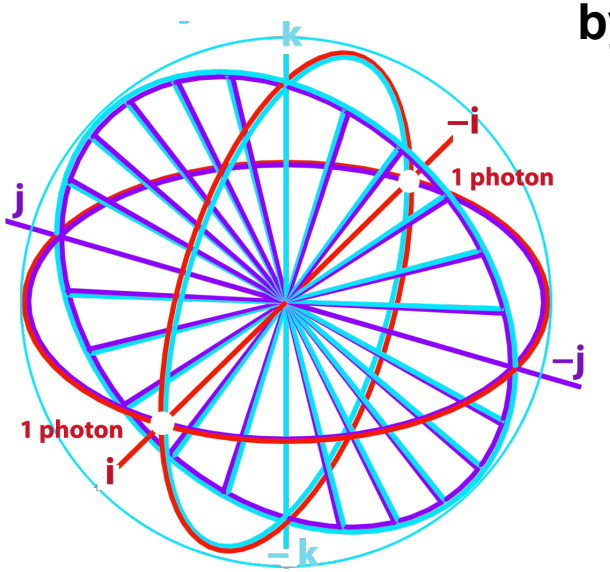
---- Potentially Actualised spot

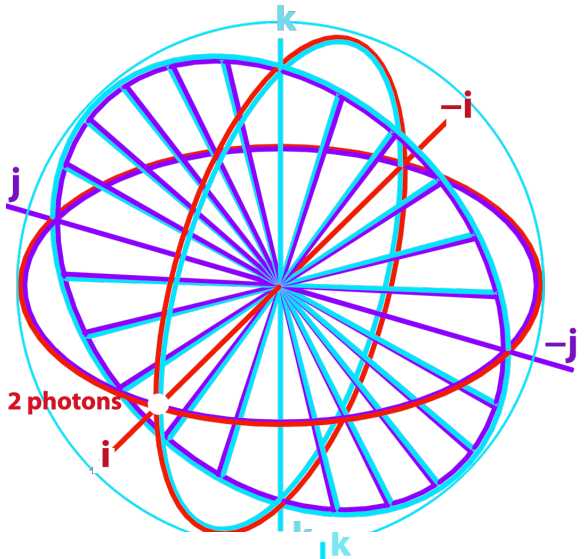
1 collective axis can be actualized by absorbing the energy of all its units.

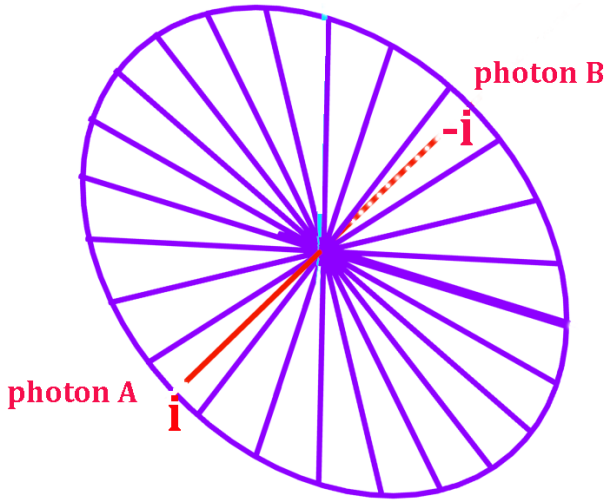
When actualized, this axis cannot be actualized by any other photon.

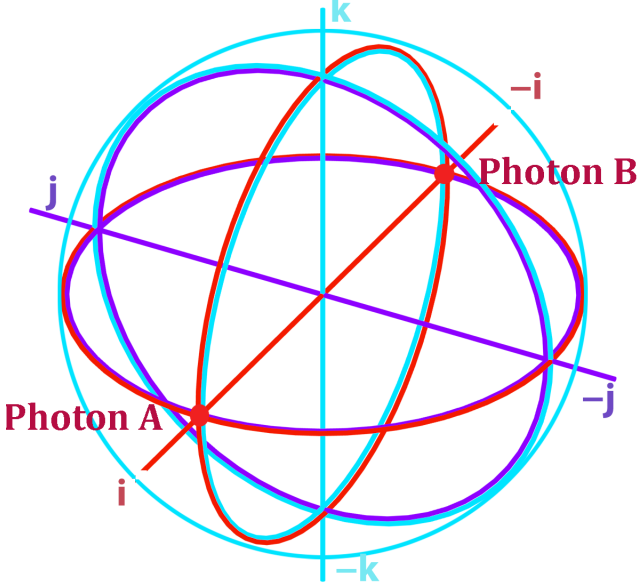
Correlation and Entanglement

Correlation = the sharing of a common diagonal or axis of a **collective wave** by 2 photons









Entanglement = the sharing of a common diagonal or axis of an individual wave by 2 photons. They rebuild a single Fiber and a single wave with 2 Focuses

To resume

--- Electromagnetic wave = aggregate sum of its units
--- 1 unit = 1 photon's wave
--- A corpuscle photon appears as an actualized dot, wrapped in its half-virtual Fiber and virtual wave.
--- Actualization = a single beat of time
--- Its wave can starts over from the level of the selected Sphere.
--- Any Cycle of a chromatic photon's wave is in a superposed state and belongs to many different Matrix Fibers
--- The electromagnetic spectrum = photon's wave property

in conclusion

The geometry of collective wave = Geometry of each of its units

This geometry potentially explains:

--- The speed invariance of light
--- The interference pattern
--- The entanglement
--- It gives a new perspective on the nature of matter particles
--- It potentially unifies Maxwell's wave and Einstein's quantum in a single frame and creates a bridge with Schrödinger equation

beatrice.reuillard@gmail.com

Thank you for your attention