hydro-wave-visualizer - Use Manual

Miguel Angel Avila Torres - © 2021

Boyacá, Colombia

EXECUTING THE APPLICATION

Open the CMD and put the following commands

Linux

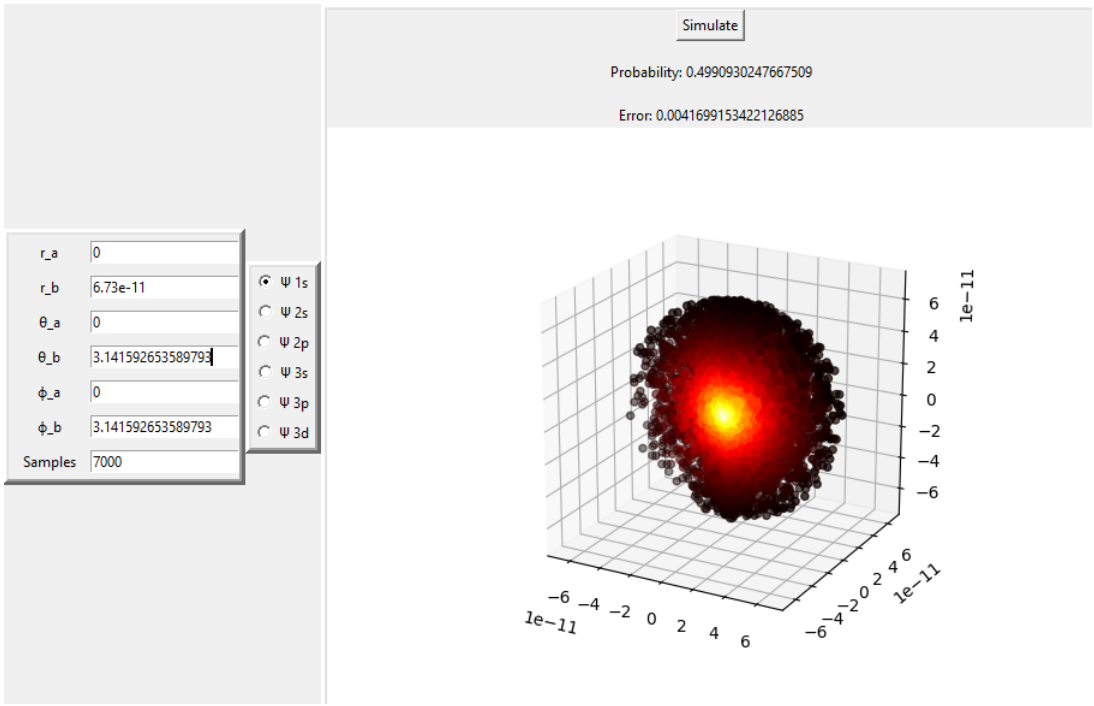
```
$ cd [full path to src/]
$ python3 hydro_wave_visualizer.py
```

Windows

```
> cd [full path to src/]
> python hydro_wave_visualizer.py
```

That will start the program. Now, for Windows, Linux and Mac users it is the same procedure, go to the folder "QLab app" and put python qlab.py, It will work if you installed all the modules required.

MONTE CARLO INTEGRATION



As is showed in the image, the Monte Carlo integral has the parameters You can fill the parameters

Application parameter	Equivalent Variable	Default Value
@r_a	r_a	0,E+0
@r_b	r_b	6,73E-11
@θ_a	θ_b	0,E+0
@θ_b	θ_b	2π
@ϕ_a	ϕ_a	0,E+0
@ϕ_b	ϕ_b	π
@samples	N	100

Table 1. Values and Parameters - Monte Carlo Integral

taking into consider the following graph which shows how spherical coordinates works:

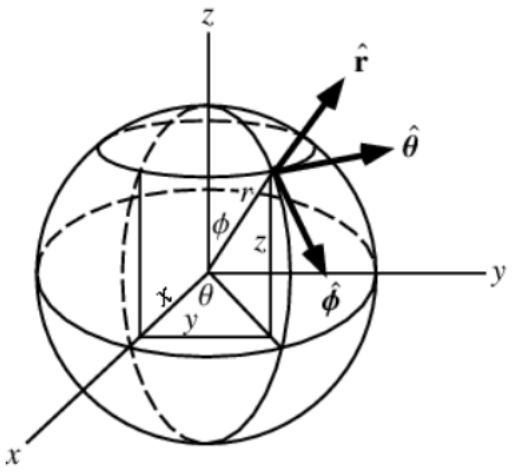


Figure 1. Source: https://mathworld.wolfram.com/SphericalCoordinates.html

Now, as to how was done the conversion from spherical coordinates to cartesian coordinates, it was done using the following equalities:

$$x = r\sin\theta\cos\phi \tag{1}$$
$$y = r\sin\theta\sin\phi \tag{2}$$
$$z = r\cos\theta \tag{3}$$

As a warning, try to not exceed the default values for the upper limits for this integral, being those @θ_a, @θ_b, @ϕ_a, @ϕ_b. That because the application was not programmed to normalize the angles (put them values into its initial value ranges). So, do not exeed for θ the value of 2π and for ϕ the value of π