**Density Parameters**

Add more functions in 'density\_formula.py'

**1.** Sphere:

* rho\_1 – density of sphere
* radius\_1 – radius of sphere

**2.** Cylinder:

* rho\_1 – density of cylinder
* radius\_1 – radius of cylinder
* Length (z\_dim) – length of cylinder

Make sure z\_dim = 2\*radius\_1

**3.** Core Shell:

* rho\_1 – inside density
* rho\_2 – outside density
* radius\_1 – radius of the outside of the cylinder
* radius\_2 – radius where the density changes inside the cylinder
* Length (z\_dim) – length of cylinder

**4.** Gaussian cylinder:

* radius\_1 – The distance from the centre to the edge of the box.
* radius\_2 – standard deviation of the distribution
* Length (z\_dim) – length of cylinder

**5.** Chopped Cone:

* radius\_1 – furthest from detector (-Z direction)
* radius\_2 – closest to detector (+Z direction)

radius\_1 must be greater than radius\_2!!!!

(just rotate it by 180 degrees if you need to.)

* rho\_1 – density inside the chopped cone
* Length (z\_dim) – length of the cone

**6.** Hexagonal Prism:

* radius\_1 – the the distance from the centre to the corner
* Length (z\_dim) – length of the prism
* rho\_1 – density inside the prism

**7.** Rectangular Prism:

* radius\_1 - width
* radius\_2 – height

radius\_1 must be greater than radius\_2!!!!!

* Length (z\_dim) – length
* rho\_1 – density inside the prism

**8.** String of bubbles:

* radius\_1 - radius of the bubbles
* radius\_2 – distance between the centres of two bubbles
* rho\_1 – density inside the bubble

**9.** Randomly chopped up cylinder:

* radius\_1 – radius of cylinder
* radius\_2 – width of the gap
* rho\_1 – density inside the chopped cone
* rho\_2 – number of gaps

**10.** Custom defined radius:

* How to enter data:
  + make a txt file.
  + Open it and put in ONE NUMBER PER LINE IN METERS!!
  + rename it to 'custom.csv'
* How the function works:
  + The program opens 'custom.csv' as a list.
  + Each element is given a value from -z\_dim/2 to z\_dim/2 at equal increments
  + The first element will be at -z\_dim/2 (away from detector)
  + The last element will be at z\_dim/2 (closest to detector)
  + A linear fit goes between two adjacent points in the list
* Length (z\_dim) – length of shape.
* rho\_1 – density inside the shape

**11.** Double Slit

Consider the outside and inside edges of the slits.

* radius\_1 – distance between the outsides of the slits
* radius\_2 – distance between the insides of the two slits.
* Length (z\_dim) – length of slits
* If you want to make the slits less wide, make a sequence with one frame, the variable y\_dim, and enter the height of the slits into start sequence.

**12.** N-Gon Truncated Cone.

It starts as an n-gon at one end, and goes to a smaller n-gon at the far end.

* radius\_1 – On the large n-gon, it is the distance from the origin to a point
* radius\_2 – On the small n-gon, it is the distance from the origin to a point.
* Length (z\_dim) – length of shape
* rho\_1 – density of points inside the shape
* rho\_2 – number of sides (i.e. a hexa-cone would have 6 sides, octa-cone would have 8 sides)

**13.** Sine Shaped Oscillations

* z-dim – length of shape
* radius\_1 – distance from origin to a peak
* radius\_2 – distance from origin to a trough
* rho\_1 – density inside the shape.
* rho\_2 – number of oscillations

**14.** Double Cone

* z-dim – length of shape
* radius\_1 – Radius at the ends
* radius\_2 – Radius in the centre

**Analytic Parameters**

Add more in 'analytic\_formula.py'

**1.** Sphere:

* rho\_1 – density of sphere
* radius 1 – radius of sphere

**2.** Cylinder:

* rho\_1 – density of cylinder
* radius 1 – radius of cylinder

**3.** Core Shell:

* rho\_1 – inside density
* rho\_2 – outside density
* radius 1 – radius of the outside of the cylinder
* radius 2 – radius where the density changes inside the cylinder

**4.** Gaussian:

* radius\_1 – distance from the centre to the edge of the box.
* radius\_2 – standard deviation of the distribution