Tutorial on

A Space Charge Tracking Algorithm (ASTRA)

As a part of ISBA 2019, students will get to learn ASTRA code written by Prof. Floettmann (DESY). This is a beam dynamics simulation code mainly used for RF Gun and related simulations.

Code can be downloaded freely from http://www.desy.de/~mpyflo/

Following files should be downloaded and stored in a folder.

For Windows Users

Astra is independent of Windows version. As long as you are able to login command prompt, it will work smoothly.

To install

Create a folder in C:\ASTRA

Download and store the files in above folder

astra.exe
generator.exe
fieldplot.exe
lineplot.exe
postpro.exe

Also, download ASTRA-Manual_V3.2.pdf from Astra Documentation link. This is a pdf file.
http://www.desy.de/~mpyflo/Astra_manual/

To run astra in Windows system, go to **command prompt.**
For Win-10; enter command **cmd** in search bar. Alternatively, enter **run** command and then enter **cmd.**
This will open command prompt.
Go to the directory C:\ASTRA
Check if all the above five executable files are existing in the folder.
type: **path=c:\ASTRA**

To run generator; type: **generator name-of-file.in**
To run astra; type: **astra name-of-file.in**
After running successfully, to see results you have to check lineplot; type: **lineplot filename.run-number**
After running successfully, to see results you have to check postpro type: **postpro lineplot filename.run-number**
To check electric and magnetic fields, have to check fieldplot; type: **lineplot filename.run-number**

For Linux Users

Astra is independent of Linux version.

To install

Create a folder in home/ASTRA

Download and store the files in above folder

astra
generator
fieldplot
lineplot
postpro

Also, download ASTRA-Manual_V3.2.pdf from Astra Documentation link. This is a pdf file.
http://www.desy.de/~mpyflo/Astra_manual/

To run astra in Linux system, go to **Terminal**
Go to the directory home/ASTRA
Check if all the above files are existing in the folder.

in the ASTRA folder type:

chmod +x filename (This will make the file executable. E.g chmod +x generator will make it executable)

To run generator; type: **./generator name-of-file.in**
To run astra; type: **./astra name-of-file.in**
After running successfully, to see results you have to check lineplot; type: **./lineplot filename.run-number**
After running successfully, to see results you have to check postpro type: **./postpro lineplot filename.run-number**
To check electric and magnetic fields, have to check fieldplot; type: **./lineplot filename.run-number**