Xes1 particle in cell simulation code of Birdsall and Langdon

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1 What it does

The code is a one-dimensional electrostatic code. It moves individual particles according to Newton's law in an electric field given by solving Poisson's equations on a mesh. The boundary conditions are periodic. Particles that exit the mesh are fed back at the other end. It is essentially collisionless, but the finite number of particles means that there is significant noise.

2 How to run it

Type in to the terminal the stuff in `fixed width font` below:

1. Log in to athena on a Sun workstation (the only ones for which the program is so far compiled).
2. `add 22.611j`
3. `cd /mit/22.611j/birdsall/xes1/xes1/inp` This is the directory where the input files live.
4. `xes1 2stream.inp` This is just one of the input files you can choose.
5. Arrange the windows that pop up to your satisfaction.
6. Start and stop by clicking the xes1 control panel buttons.

3 Trying your own experiments

Copy some input files to your own athena area and edit them. Run xes1 on them and watch the results.

4 More information

You can read about the input file format in `birdsall/xes1/xes1/doc/es1.ps.`

For details of the algorithms etc., consult ``Plasma Physics via Computer Simulation'' C.K.Birdsall and A.B.Langdon, IOP Publishing, 1991.

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