Note 1: sk01 simulation codes as that of new system skh18n and summary of Frontera manual for sk01

1. sk03main.f (sk03main.f and sk03input.f) (pair jet, $\gamma = 15$)

Number of processors (81)

--> `partd_000_001`, *, *, `partd_000_025`

Plot3Dsk01Rs.f giving 25 sets of particles and fields data for further diagnostics at dsk01

```
--> efield_003, *, *, efield_025
bfield_003, *, *, bfield_025
ions_003, *, *, ions_025
lecs_003, *, *, lecs_025
lecj_003, *, *, lecj_025
ionj_003, *, *, ionj_025

kenout_003, *, *, kenout_025
```

fields and particles data

Diagnostics

These data set must be move to dsk03n for further diagnostics

mv io* le* fie* ken* ../dsk03n !move command

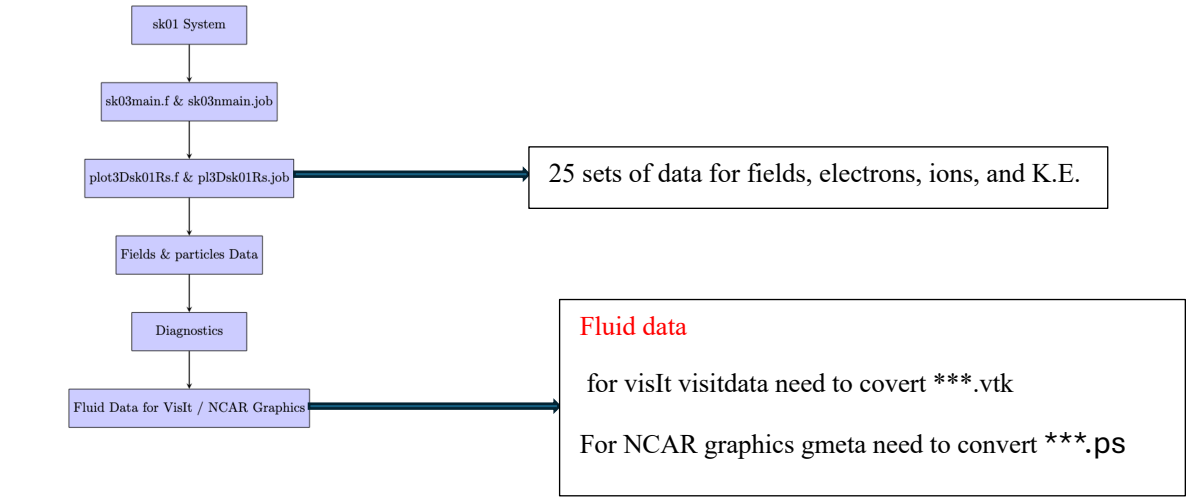
Now work start at dsk01

2. Diagnostics at dsk01

--> djxBxzNA.f
dByBxzNA.f
dphasx-vx01.f
compD

These program gives fluid data can be plot by using NCARgraphics or visIt

Workflow chat for the sk01 system



On Frontera home1, the two-directory named sk01 and dsk01 is created. At first sk01.zip copied to sk01 from local computer. Now after unzipping the sk01.zip, move all the necessary files to parent directory sk01. Now, the dummy sk01 is empty and remove it. Now the parent sk01 has all the necessary files such as sk03input.f, sk03main.f, sk03.job whereas the dummy sk01 is empty and remove it. In sk01, the simulation parameter can be modified by opening sk03input.f then can

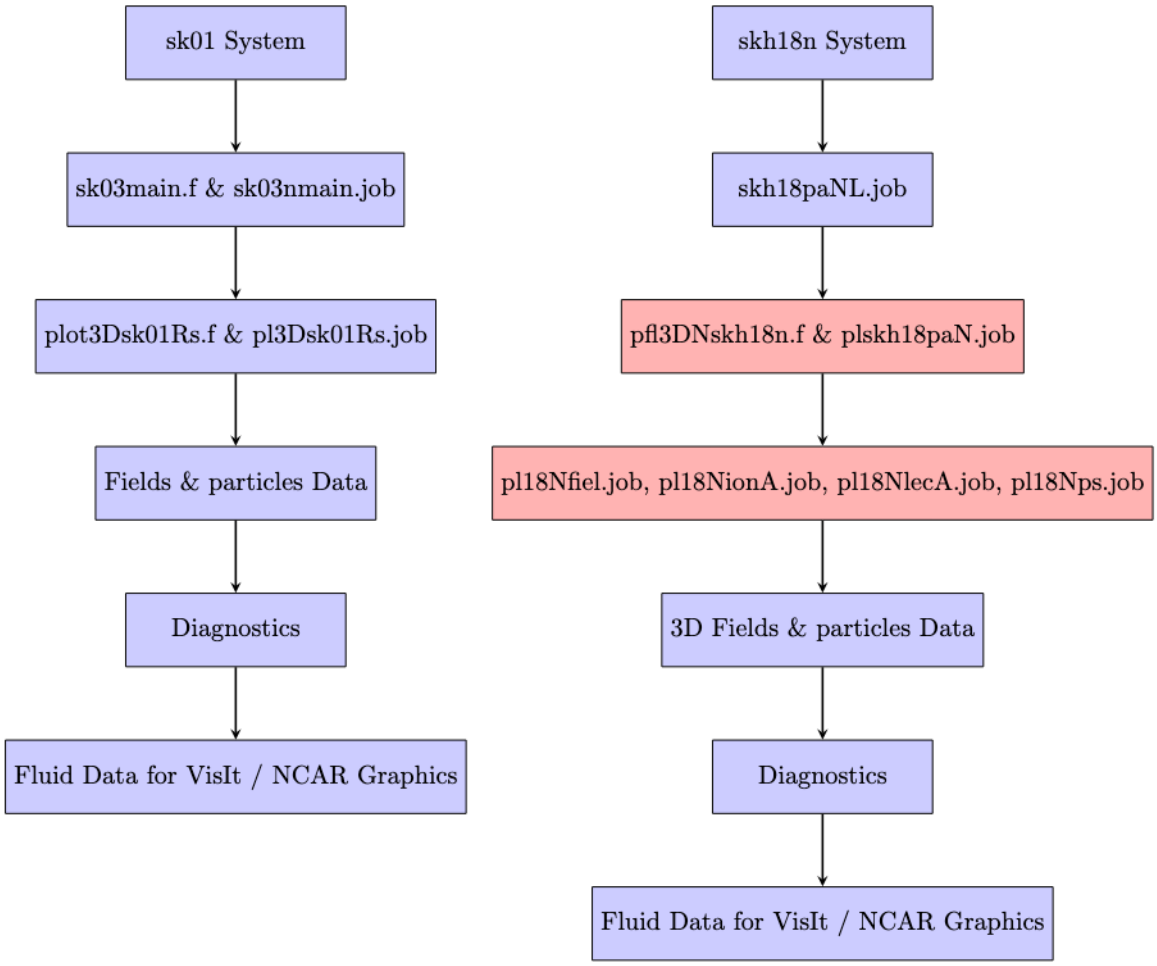
compile sk03main.f. When it gets compiled, we can modify the job script. Before submission of the job, the temporary directory named sk03n must be created on scratch1. On modifying the job script, much attention to be paid on job ID's, cp and cd for copying executive files and changing working directory. After job submission we can check the job status by using lq command. At this point we will get `partd_080_001`, *, *, `partd_000_025` data. Now we compile the anther program files plot3Dsk01Rs.f and run the job pl3Dsk01Rs.job to generates particles data, fields data, and kinetic energy data which are transfer to another temporary directory dsk03n for diagnostics purpose. Here code plot3Dsk01Rs.f creates multiple files of dataset simultaneously at the same time using multiple processors. This program is based on parallel version of TRISTAN-MPI. Now obtained 3D data should be moved into another temporary directory dsk03n.

To store and compile the program files and job scripts for diagnostics, another directory dsk01 is to be created on Frontera home1. All the program files for diagnostics such as djxBxzNA.f, dphasx-vx01.f, visJxBlineLLnew.f, complier compD, and their job files should be stored in this directory. Before submission of job for diagnostics, another temporary directory named dsk03n must have all the output data (data for fields and particles). Now it is ready to submit the job for diagnostics. First, we compile the program then modify the job script and submit the job so that we can get the visitdata/gmeta (fluid) data. Now the visitdata must be converted into ****.vtk and gmeta data to ****.ps. These files are transferred to the local computer to get the plot by using visIt (for visitdata) and Okular (for NCARGraphics) in linux OS. It is very essential to train learner's with vi command with provided Frontera manual.

The test run with a smaller sk01 system is based on parallel version of TRISTAN-MPI. The summary of process is as shown in above chart. In this system the important job is pl3Dsk01Rs.job. The program plot3Dsk01Rs.f generates fields and particles data for diagnostics. This is based on parallel version in which dataset is process simultaneously using multiple processors.

On moving to the new system skh18n i.e. serial version, the generating and combing fluid data into 3D fields & particles data is done manually by running job plskh18paN.job and then the jobs such as pl18Nfiel.job, pl18NionA.job, pl18NlecA.job, and pl18Nps.job.

Difference between sk01 system and new skh18 (skh18n) system



The main difference between the two system is that in skh18n we need to proceed manually to run two jobs indicated in red box to generate 3D data required for further diagnostics at dskh18. These two jobs run, generates the fields and particle quantities and combined them into 3D data. These are based on the serial version in which single processors process data in sequential order.