Import particles into Genesis

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First (primary) approach: import particles into Genesis

- Genesis requires each slice has the same number of particles, which is usually not satisfied when importing particles from beam dynamics simulation.
- This approach get around the issue by adding particles with negative energy (gamma=-1) since Genesis ignores particles with negative energy, i.e. treat them as lost particles.
- When using this approach, we set curlen=0 (or negative values) so that the local current is proportional to the number of imported particles with positive energies.

\[
\text{local current} = \text{curpeak} \times \text{npart} / \text{npart0}
\]
Import particles using PARTFILE, NWIG=1
There was a problem with mpi, which is solved the following modification:

May be a typo in the original code?
Another approach: Import Distribution Into Genesis Using DISTFILE

- When using DISTFILE, Genesis read in the particles, make mirror particles and then add particles so that the number of particles in each slice is equal (=npart in .in file).
- The advantages is one can generate as many as particles needed within Genesis and hence easy to incorporate the slice from modulator simulation.
- The disadvantage is that macro-particles from difference slice will have different charge, which may require modification of the kicker code.
• One need to vary NTAIL and NSLICE to choose desired longitudinal range of the distribution.
• The .dpa and .dfl files needs to be deleted before any Genesis run to get the correct particle distributions.
NTAIL=5, NSLICE=3000, NWIG=1