Magnetic Fusion Energy: “Effective speed” increases came from both faster hardware and improved algorithms.

- Full Earth Simulator (Japan)
- 1000 NERSC SP3 processors (typical)
- 16 processor Cray C90
- Cray YMP

Effective speed from hardware improvements alone:
- semi-implicit
- partially-implicit
- gyro-kinetics

Improved linear solvers:
- high-order elements

Improved electron models:
- delta-f, magnetic coordinates

Micro-turbulence effective speed:
- improved MHD effective speed

Effective speed in equiv. gigaflops

Calendar Year