

A Linux PC Cluster for Between-Pulse EFIT and Other CPU Bound Analyses at DIII-D

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Abstract

A 12-processor Linux PC cluster, STAR, has been installed to perform between-pulse magnetic equilibrium reconstructions using the EFIT code written in Fortran. The MPICH package implementing Message Passing Interface is employed by EFIT for data distribution and communication. The new system calculates equilibria eight times faster than the previous system yielding a complete equilibrium time-history on a 25 ms time-scale four minutes after the pulse ends. A graphical interface is provided for users to control the time resolution and the type of EFITs. The next analysis to benefit from the cluster is CERQUICK written in IDL for ion temperature profile analysis. The plan is to expand the cluster so that a full profile analysis (Te, Ti, ne, Vr, Zeff) can be made available between pulses, which lays the ground work for Kinetic EFIT and/or ONETWO power balance analyses.

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