

Remote Operation of Large-Scale Fusion Experiments*

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This paper examines the past, present, and future remote operation of large-scale fusion experiments staffed by large, geographically dispersed teams. The fusion community has considerable experience placing remote collaboration tools in the hands of real users. The ability to remotely view operations and control selected instrumentation and analysis tasks was demonstrated as early as 1992. Full remote operation of an entire tokamak experiment was tested in 1996. Today's experiments invariably involve a mix of local and remote researchers, with sessions routinely led by scientists at remote institutions. Most recently, the work of the National Fusion Collaboratory Project has created FusionGrid for secure remote computations and has placed collaborative tools into operating control rooms. Looking toward the future, ITER is a burning plasma magnetic confinement experiment located in France and is the next major step in an international program aimed at proving the scientific viability of controlled fusion as an energy source. Fusion experiments put a premium on near real-time interactions with data and among members of the team and though ITER will generate significantly more data than current experiments, the greatest challenge will be the provisioning of systems for analyzing, visualizing and assimilating data to support distributed decision making during ITER operation.

Classification: Major Challenges
Fusion

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