Parallelization of MHD spectral analysis at NSTX SETH VEITZER[1], Tech-X Corporation, JONATHAN MENARD[2], Princeton Plasma Physics Laboratory, PETER STOLTZ[3], Tech-X Corporation — The ability to perform between-shot analysis of NSTX plasmas can be limited by the amount of time it takes to complete the analysis. For instance, MHD fluctuation spectral analysis is presently too time consuming if the complete toroidal array is included in the analysis and the processing is done in serial. We show here a method of parallelizing the MHD mode calculation, written in the IDL language, which gives up to 5x speedup over the serial case for the entire computation. This method decomposes the problem in the temporal domain, which provides better improvement in performance than decomposition in the spatial domain. However, this decomposition requires all of the parallel processors to load all of the MHD data prior to starting the computation. For this reason, further improvement can be achieved with the addition of a parallel MDSPlus data server, which we also describe.

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