ROBUSTNESS AND FLEXIBILITY IN NCSX: GLOBAL IDEAL MHD STABILITY AND ENERGETIC PARTICLE TRANSPORT*

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The three-dimensional MHD stability code package CAS3D3[1] is being used to evaluate the positional and kink mode stability of candidate QAS designs for NCSX. CAS3D has verified and extended calculations[2] of the TERPSICHORE code, showing stability of the kink and periodicity-preserving modes for the proposed stellarator, even without a conducting wall[3]. Results will be presented on the effect of the variation of pressure and iota profiles on the positional and kink mode stability. The CAS3D code package is being ported to run on a DEC alpha workstation as well as on the CRAY J90 and C90 supercomputers. Comparisons to calculations carried out on the CRAY machines will be reported.

Energetic particle transport is being studied with a guiding center code ORBITMN[4]. New calculations will study the flexibility and robustness of the design configuration, examining the effect of current and pressure profile variation on energetic particle transport, in addition to the stability response of the plasma.

* Supported by DoE Contract DE-AC02-76CH03073.

** Department of Energy National Undergraduate Fellowship Program.

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