Ideal MHD stability code MARG2D for the analysis of external MHD modes in JT-60U plasma NOBUYUKI AIBA, JAERI-Naka, SHINJI TOKUDA, JAERI-CCSE, TOMOKO ISHIZAWA, RIST, TAKAHISA OZEKI, JAERI-Naka — The MARG2D code has been developed to identify the stability of equilibrium against ideal MHD perturbations.[1] With the property of the two-dimensional Newcomb equation, this code realizes to determine whether the equilibrium is stable or unstable explicitly against a broad n range of ideal MHD modes, including a low-n kink-ballooning mode and a intermediate-n peeling-ballooning mode ($1 \leq n \leq 100$), where n is the toroidal mode number.[2] Moreover, since this code is developed as a parallel computing code, we can analyze the stability of an equilibrium in short time. The MHD stability of JT-60U plasma will be analyzed in detail with these advantages; in particular, a role of low-n external modes on constraining the achievable plasma pressure, and the property of a peeling-ballooning mode stability that is thought to be responsible for edge localized modes (ELMs) phenomena. Here we present results of recent progresses of the MARG2D code; emphasis is put on detailed code benchmarking results. [1] S. Tokuda et. al., Phys. Plasmas 6, 3012 (1999). [2] N. Aiba et. al., submitted to Plasma Phys. Control. Fusion.

Nobuyuki Aiba
JAERI-Naka

Date submitted: 02 Aug 2005   Electronic form version 1.4