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Robust Matching System for the ITER Ion Cyclotron System
D. SWAIN, R. GOULDING, D. RASMUSSEN, Oak Ridge National Laboratory, Oak Ridge, TN, M. VERVIER, A. MESSIAEN, P. DUMORTIER, Royal Military Academy, Brussels, Belgium — The ITER ion cyclotron system is required to deliver 20 MW to the ITER plasma under a number of different operating scenarios. The EU will fabricate the antenna, the US will supply the matching system and transmission lines, and India will deliver the rf sources and high-voltage power supplies. A brief description of the complete ion cyclotron system will be presented, and different design options for the matching system will be discussed. Emphasis will be on analyzing the ability of the system to operate effectively during sudden changes caused by plasma perturbations (e. g., ELMs), and on the robustness of matching algorithms. Particular challenges are: the possibility of relatively low loading of the antenna by the plasma because of a large plasma-antenna distance; the resulting high voltages in the matching system (which must be minimized by good system design); the need to install a number of large matching components in the tight space available near the tokamak; and the requirement for operation and maintenance in a radiation environment.

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