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On the feasibility of $\mathbf{T_i}$ collisional heating and $\mathbf{T_e/T_i}$ control on DEMO using ECRH GUILLERMO SUAREZ LOPEZ, EMILIANO FABLE, EMANUELE POLI, GIOVANNI TARDINI, Max Planck Institute for Plasmaphysics, HARTMUT ZOHM, Max Planck Institute for Plasmaphysics, Ludwig Maximillian University of Munich, THE EUROFUSION MST1 TEAM — We explore the physical feasibility of a DEMO1 scenario supplied uniquely with Electron Cyclotron Resonant Heating (ECRH) as the external heating and current-drive system. Specifically, we study the ability of ECRH to collisionally heat a deuterium-tritium mixture from L-mode to H-mode, while controlling the T_e/T_i ratio, crucial for the onset of ITG turbulent transport. Simulations with the ASTRA code [1] employing the TGLF code [2] as the turbulent transport model, are used to assess the kinetic profile temporal evolution of such a DEMO1 discharge. Boundary conditions at the plasma edge are applied to model the transition from the initial L-mode to H-mode flat top, including the treatment of the H-mode pedestal. Numerical scans over the position and width of the ECRH deposition layer, ECRH available power and plasma density Greenwald fraction are performed. For each scan, a power balance analysis is made with regards to collisional heating from electrons to ions, electron and ion heat fluxes and T_e/T_i ratio temporal evolution. The results and conclusions drawn from such scans will be presented at the conference.
[1] G. V. Pereverzev et al. Tech. rep. 5/98. Max-Planck-Institut fur Plasmaphysik, 2002.
[2] G. M. Staebler et al., In: Physics of Plasmas 12.10 (2005)

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