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Optimization of CFETR confinement by controlling rotation shear and pedestal collisionality XIANG JIAN, Huazhong University of Science Technology, JIALE CHEN, Institute of Plasma Physics Chinese Academy of Sciences, VINCENT CHAN, University of Science and Technology of China, GUOQIANG LI, Institute of Plasma Physics Chinese Academy of Sciences, GE ZHUANG, Huazhong University of Science Technology, CFETR PHYSICS TEAM — Optimization of a CFETR baseline scenario (Chan et al 2015 Nucl. Fusion. 55) with EC and NB H&CD is performed using a multi-dimensional code suite. Rotation shear is controlled using NB, with injection angle being constrained to avoid edge heating and to maintain q_min >2. The NB power is adjusted to keep the plasma fully non-inductive. The NB energy that maximize the fusion gain Q is identified. Tradeoff between the pedestal density and temperature is performed with the pedestal pressure fixed. It is found that Q increases with pedestal density, while the density peaking factor (DPF) remains unchanged. Linear analysis shows that the transport is dominated by TEM and ITG turbulence. Collisionality affects these turbulences in such a way that the induced changes in DPF cancel out. A weaker dependence of DPF makes higher density operation more favorable for fusion gain.

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