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P5.1086 Heat Transport Analysis for the High-betan Discharge on EAST

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Recent experiments on the EAST tokamak have extended the high-βN scenario towards the steady-state burning plasma regime by combination of NBI heating and LHW injection to obtain ~100% non-inductively-driven operation. By employing a very broad current profile, the negative magnetic shear leads to a high normalized beta (β⊠~2.4) and the energy confinement factor reaches about 1.0.
The ion temperature of the discharge discussed in this paper is slightly higher than the electron temperature. The ion and electron temperature both become strongly peaked in the core during the higher N phase and leads to the ITB formation. The LHW deposit position moves outward with the increasing auxiliary heating power which leads to an off-axis total current profile. The negative magnetic shear results in the escalating q0 and q⊠⊠⊠(q0~4, q⊠⊠⊠~3.5), while q95 remains around 7 in spite of the βN increasing. The bootstrap current faction is 20% and completely non-inductive driven current occurs when βN reaches 2.3.
The electron and ion thermal diffusivities derived from TRANSP code increase systematically with higher central electron heating and remain well above the neoclassical level. The χi and χe shows different relationship with βN during the typical discharge. Gyrokinetic simulation by GTC code is taken out to study the turbulence change with the βN changing for the typical high-βN discharge.

References:
1. B.N. Wan et al 2017 Nucl. Fusion 57 102019
2. X. Gao, et al 2017 Nucl. Fusion, 57 056021.
3. H. Doerk et al 2018 Nucl. Fusion 58 016044
4. G. L. Falchetto et al 2003 Phys of Plasmas 10 1424
5. M. J. Pueschel et al 2008 Phys. Plasmas 15 102310

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