Contribution ID: **835** Type: **Poster**

Magnetic shear effects on plasma transport and turbulence at high electron to ion temperature ratio in DIII-D and JT-60U plasmas

Friday, 21 October 2016 14:00 (4h 45m)

Negative magnetic shear has been demonstrated to mitigate the confinement degradation typically observed with increasing the electron to ion temperature ratio (Te/Ti), and the mechanisms are now understood in terms of fluctuation measurements and gyrokinetic (GK) simulations in DIII-D steady-state plasmas. The impact of Te/Ti on plasma transport and confinement is a critical issue for ITER and DEMO, where electron heating by alpha particles will be dominant. In the new experiments in DIII-D negative magnetic shear (NS) discharges, the Ti profile was maintained as Te/Ti increased through electron cyclotron range of frequency (ECRF) heating, while in positive magnetic shear (PS) plasmas, a large reduction in Ti was observed at increased Te/Ti. The different transport behavior has been explained by the turbulence measurements and GK simulations; the increase in Te/Ti had less impact on broadband turbulent fluctuations in the NS plasmas compared with that in the PS plasmas. The difference reflects changes in thermal energy confinement; the ion thermal diffusivity remained constant in the NS plasma but increased in the PS plasma when ECRF was applied. The reduced confinement degradation at high Te/Ti with NS has been commonly observed in DIII-D and JT-60U.

Paper Number

EX/8-1

Country or International Organization

Japan

Primary author: Dr YOSHIDA, Maiko (National Institutes for Quantum and Radiological Science and Technology)

Presenter: Dr YOSHIDA, Maiko (National Institutes for Quantum and Radiological Science and Technology)

Session Classification: Poster EX/7, EX/8, TH/5, TH/6, EX/11, TH/9, FIP/3, FIP/4, PD

Track Classification: EXC - Magnetic Confinement Experiments: Confinement