EIGHTEENTH FUSION ENERGY CONFERENCE

SESSION OV4

Thursday, 5 October 2000, at 09:00 a.m.

Chair: F. De MARCO (Italy)

SESSION OV4: Magnetic Fusion Overview 3 (provided by B. PETERSON, Japan)

Paper IAEA-CN77/OV4/1 (presented by A. Sykes)

DISCUSSION

V.K. GUSEV: What was the density achieved in 1 MA discharges?

A. SYKES: The high current 1 MA discharges were obtained at a relatively low density of $\langle n_e \rangle \sim 2.5 \times 10^{19}$ m^{-3}.

K. IDA: In general a change of the radial electric field is observed at the L/H transition. However, the strong TTMP damping due to high toroidicity in MAST should prevent the increase of poloidal rotation. Therefore one can expect a large contribution of the toroidal rotation to the radial electric field. Do you observe any change of toroidal or poloidal rotation at the L/H transition?

A. SYKES: Preliminary results suggest that (as found on START) the poloidal rotation increases immediately after L/H transition.

S. ORTOLANI: How will you handle VDEs and disruptions when going to higher currents in MAST?

A. SYKES: Results from operation at up to 1 MA plasma current show that halo currents (and faces) due to VDEs are much smaller than anticipated in the engineering design of MAST. Disruptions have so far only occurred as a slow series of IREs. Therefore neither form of current termination is expected to pose a serious problem for high current operation.

F. ROMANELLI: What is the maximum value of $n/n_{Greenwald}$ achieved in H-mode?

A. SYKES: A scan in density has not yet been made. Typical L-H transition occurs at about one-third n_G. Some ohmic discharges have achieved transient H-mode at $n \sim n_G$, but these plasmas are smaller, of aspect ratio $A = R/a \sim 2$.

R. GRANETZ: What causes the disruptions on MAST? (low q, high n, impurity injections?)

A. SYKES: The VDEs are caused by operation in a vertically destabilizing field together with a prototype vertical position feedback system. The major disruptions have so far occurred only at low q.

Paper IAEA-CN77/OV4/2 (presented by M. Ono)

DISCUSSION

R. CESARIO: Request of information about Z-effective evolution during the injection of fast waves.

M. ONO: During HHFW, we do observe an increase in the radiated power. But the radiative power fraction remains very similar to the ohmic level, staying below 20%. The dominant impurities are carbon and boron with essentially no metallic impurities. At the moment, we do not have a precise Z-effective value, but based on various spectroscopic and X-ray diagnostics plus the observation of a loop voltage drop, we do believe Z-effective to be similar to the ohmic value.

Paper IAEA-CN77/OV4/3 (presented by R. Jaenicke)

DISCUSSION

K. IDA: High confinement is explained to be due to the reduction of neoclassical transport. However the optimized confinement discharge was explained to be due to the reduction of anomalous transport in the Baldzuhn paper (Plasma Physics and Controlled Fusion **42** (2000) 463). What is the difference between high confinement discharge and optimized confinement?

R. JAENICKE: There is no difference between "high confinement" and "optimum confinement" discharges. The improved confinement is essentially due to neoclassical transport reduced by radial electric fields. Anomalous transport is low because of some unknown mechanism.

R. TAYLOR: Congratulations on using the radial electric filed to get away neoclassical confinement. At the same time can you say something about the electron channel?

R. JAENICKE: The radial electric fields are caused by thermal ion particle losses. Therefore, they are too small to have an effect on the electron channel.

Paper IAEA-CN77/OV4/4 (presented by C. Alejaldre)

DISCUSSION

H. YAMADA: How do you conclude that the ELM-like activity is triggered by the resistive ballooning mode? Have you got any experimental observation?

C. ALEJALDRE: We arrived at that conclusion after a thorough theoretical simulation which was consistent with the experiment. We did not have direct experimental observation of the mode.