EIGHTEENTH FUSION ENERGY CONFERENCE

SESSION OV2

Wednesday, 4 October 2000, at 2:45 p.m.

Chair: V.P. SMIRNOV (Russia)

SESSION OV2: Magnetic Fusion Overview 2 (provided by M. KIKUCHI, Japan)

Paper IAEA-CN77/OV2/1 (presented by O. Gruber)

DISCUSSION

R.J. TAYLOR: You had everything in this talk – stiff and steep gradients. In the case of stiff ITG limited gradients, is the identification experimental or via analysis and possibly coincidence?

O. GRUBER: We have experimentally verified that the ion and electron temperature profiles are stiff. This was also confirmed by heat pulse experiments. The temperature gradient length for the ions is over a large part of the radius at R/5. We have then simulated the T profiles with ITG/TEM models (Weiland, GLF23, IFS-PPPL) with the measured density profiles and T (ρ = 0.8) as boundary conditions and the agreement with experiment is very good. With steep temperature gradients, the ITG suppression by $\omega_{E\times B} > \gamma_{lin}$ was proved and simulations with neoclassical ion transport for $\rho \leq \rho(q_{min})$ again agree with the experimental results.

Paper IAEA-CN77/OV2/2 (presented by I.H. Hutchinson)

DISCUSSION

G.T. HOANG: Did you observe any accumulation of impurities in the ITB discharges with ICRF? Does the energy confinement improve in these discharges?

L.H. HUTCHINSON: There is some evidence of increasing central Z_{eff} in the off-axis ICRF triggered density transport barriers. In these plasmas, detailed energy-transport analysis has not yet been performed.

C. GORMEZANO: Your particle transport barrier seems to be very well localized at about mid-radius. Does this location correspond to the location of the ICRH resonance?

L.H. HUTCHINSON: In ICRF-triggered density transport barrier plasmas, the position of the foot of the barrier does not seem to move over the range of resonance positions we have explored. Also, Ohmically heated core barriers in comparable plasmas are located in a similar position. Therefore, we do not think the barrier foot position is controlled by the ICRF resonance.

C.S. CHANG: It is important to verify if the rotation from ICRF L-mode and Ohmic H-mode are from the same physical origin. One thing to examine would be to compare the radial profile of the rotation. Have you done this experiment?

L.H. HUTCHINSON: We do not have complete profiles of toroidal velocity yet but recent measurements have shown rather flat velocity profiles over the innermost 40% of the radius.

M. OTTAVIANI: Do you have evidence of the dependence of the critical scale length on the local safety factor?

L.H. HUTCHINSON: In so far as the confinement follows standard scalings, including the current dependence, our results imply that the critical scale-length might contain a q-dependence. However, we do not yet have detailed studies that separate the scale-length dependence from the observed increase in pedestal height with plasma current.

Paper IAEA-CN77/OV2/3 (presented by P. Ghendrih)

DISCUSSION

D. FRIGIONE: You observe RI-mode-like behaviour during ICRH. Can you rule out the possibility that ICRH injects impurities?

P. GHENDRIH: Discharges labeled "RI-like" modes have been obtained when trying to reproduce the RI-mode of Textor. Common features are high density with fuelling dominated by the wall. Impurity injection does not modify the performance of these shots. It is now understood that these shots exhibit an increase of the hydrogen minority and thus a branching of ICRF heating from the electron towards the ion channel. In these shots, ICRH coupling is carefully monitored and there are no impurities generated by ICRH. Also, Tore Supra operates with no NBI, another difference with Textor operation in the RI-mode.