DISCUSSION SUMMARY REPORT

Session: EX/4 - PPC/1

CHAIR: J. Li (China)
SPEAKERS: C.C. Petty (USA), J. Qian (China), A.M. Grafalo (USA), H. Takahashi (Japan), S. Sakakibara (Japan), M. Hirsch (Germany)

Session Ex/4 and PPC/1 on Wednesday afternoon (16:40-18:20 hrs) were devoted to steady state operations and hybrid scenarios which are two key issues for ITER Q=5 steady state and Q=10 hybrid operation in future. Six talks were presented in devices like DIII-D, EAST, LHD and W7-X. The session shows several promising results for steady state operation. What is presented here is a brief summary of the discussion, which followed after each talk. Question discussion and conclusions are detailed below with questioners indicated in brackets.

Petty (GA) introduces the advances in steady-state hybrid regime recently in DIII-D. A full noninductive ELM-suppressed scenario has been obtained which could be applied in ITER. By edge impurity seeding, there is no any impurity accumulation in the center during the whole discharge. Questions started (Tendler, Sweden) that electric field profiles at the edge play a role due to RMP ELM suppression. ELM suppression phases a real ELM suppression or just ELM mitigation (Putterich, Germany). Due to observation is not high collisionality grassy ELMs, ELM pulses are small in any case, independents of what they are.

Qian (ASIPP) presented a joint experiments between DIII-D/EAST for simulation ITER Q=5 senior on DIII-D. Very good performance has been obtained on DIII-D with beta N over 3, bootstrap over 80% (50% for ITER) and density at 80% of greenwald limit. The foot point of rotation for high rotation is ~0.7 and the foot point of rotation for low rotation is ~0.5 the explanation why the foot point of rotation is different between these two discharges (Ida, Japan) maybe because the torque input profiles determined by co- and counter- NBI are different between these two discharges. The role of the fast ion on core confinement (Litaudon, Eurofusion) is classical and the drive for the AE instability is low. Control negative shear is also important (Kikuchi, Japan) and compared with that of weak shear on DIII-D.

Garofalo (GA) also presented joint experiments between DIII-D/EAST for development of high poloidal beta, steady state scenario with ITER-like W divertor on EAST. A fully non-inductive over 1 min. H-mode driven by RF (LH+EC+IC) has been obtained on actively cooled W divertor. Divertor temperature quickly reaches its stable condition within 10s and shows its merit for heat load removing capacity (10MW/m2). Ti was measured (Crisanti, Italy) and W shows no accumulation during discharge (Joffrin, CEA).
Takahashi (NIFS) shows LHD high temperature scenarios with low density with clear Te ITB structure. While Sakakibara (NIFS) presents the new efforts for high beta up to 4.5% at 1T at low collisional regime. The Er was measure by HIPB diagnostic but the role of Er (Dinklage, Germany) during this high Te scenario is still not clear. The density profile is very hollow; the consequence for the pressure profile (Geiger, Germany) is measured during discharges which is very broad and flat.

Finally Hirsch (IPP) presented the preliminary results from W7-X limiter plasma. A comparison with scaling law was made. Time trace of ion temperature increases during discharge which is just classical collision effect not due to the good effect with ECH turning off (Okamura, Japan). Since present experiment was performed in limiter configuration, whether limiter works as a particle source is still not clear (Tanaka, NIFS).