**EIGHTEENTH FUSION ENERGY CONFERENCE**

**SESSION PD**

Tuesday, 10 October 2000, at 2:30 p.m.

Chair: R. GOLDSTON (USA)

**SESSION PD:** **Post Deadline Papers** (provided by N. POMPHREY, USA)

**Paper IAEA-CN77/PD/1 (presented by J. Pamela)**

**DISCUSSION**

**R. GOLDSTON:** The JT-60U people, at the beginning of the conference, presented their "advanced tokamak" data on a sort of multidimensional plot with $\beta_N$, $Z_{eff}$, $n/n_{gw}$, and a number of other parameters compared with ITER's requirement for AT modes. It looks like you might have shown us for the first time a true ITER demonstration discharge for the standard ELMy H-mode regime. Have you checked over all of the relevant parameters to be able to make such a claim?

**J. PAMELA:** Indeed the JT60U AT plots are very useful tools to measure the progress towards fully integrated AT performance. As for the very recent ITB experiments presented today, no attempt has been made to plot those in such diagrams, although this will certainly be helpful to steer future experiments. By the way, detailed analysis is still going on. As for ELMy H-modes, I take your suggestion and will try to develop similar diagrams applicable to the demonstration of ITER Reference Scenario integrated performance.

**Paper IAEA-CN77/PD/2 (presented by S. Alberti)**

## DISCUSSION

**V. PARAIL:** Did you try to calculate ECRH power absorption with bi-maxwellian distribution, to take into account the suprathermal tail?

**S. ALBERTI:** The version of the TORAY code presently used at CRPP has not included a module allowing to calculate the absorption with a bi-maxwellian distribution function. We are presently both extending the TORAY code with this additional module and in parallel calculating the self-consistent distribution function by means of a Fokker-Planck code.

**R. PRATER:** Do your results with radial launch of the X3 mode affect your plans for top launch of the same mode?

**S. ALBERTI:** The launching antenna for the X3 mode from the top launch has been designed and constructed for 1.5 MW injection and will be operational on TCV for the beginning of next year. However, in the first part of the next experimental campaign, the present LFS launch of X3 (0.5 MW) will be maintained in parallel with 1.0 MW (i.e. two gyrotrons) from the top launch. This configuration will allow us to directly compare the absorption of $3^{rd}$ harmonic X-mode in the two launching configurations. It should be noticed that the flexibility of the constructed system will allow an easy switch from the LFS to top launch injection at a later date.

**Paper IAEA-CN77/PD/3 (author Q. Yu, paper presented by S. Günter)**

### DISCUSSION

**D.J. CAMPBELL:** The possibility of reducing the drive for NTM's by applying a helical field is intriguing. However, at the ITER scale the critical error field which can produce, for example, m=2, n=1 modes may be very small ($B_r/B_\varphi \sim 1^{-4}$). Although the proposed helical field coil would be designed to have m/n < 1, can a practical helical coil arrangement be produced which would satisfy the requirement that the stray (2,1) component would satisfy the constraint on amplitude implied by the need to avoid (2,1) error field modes?

**S. GÜNTER:** To stabilize NTMs, non-resonant helical fields are sufficient. This allows not only for large n numbers (|m/n| < 1), but even for negative m/n values, which could reduce the (2,1) component even more. If really necessary, an error field correction of the produced (2,1) mode would be possible.

**R. GOLDSTON:** In one of your figures it seemed that the plasma became rather ergodic between the two islands, as one island "turned off" the other. Is this required? Also, have you checked your calculation at more extreme $\rho*$, to see if it works with the smaller seed islands (relative to a) expected in future devices?

**S. GÜNTER:** An ergodic region between the two islands is not required for stabilization. It is true, however, that very small islands (island widths not much larger than $\rho$) of different helicities could occur simultaneously. Such islands, however, are probably not too harmful for a reactor.