THE NEXT WORKSHOP

It was decided to hold the Third Workshop on Plasma Focus in 1983 in Aachen, Federal Republic of Germany, after the Eleventh European Conference on Controlled Fusion and Plasma Physics. H. Herold will serve as the conference executive.

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Editor's Comment: *The Plasma Focus Workshop summarized here was held in conjunction with the Tenth European Conference on Controlled Fusion and Plasma Physics, Moscow, USSR, September 16-19, 1981. This summary was prepared by Professor O. Krokhin, executive for the workshop and Dr. N. Kalachev, scientific secretary. A significant effort in the elaboration of this summary was put forth by the chairman of the closing session, Dr. C. H. Maisonnier. A brief comment on the conference itself appeared earlier in* Nuclear Technology/Fusion, *2, 135 (1982).*

SUMMARY OF THE U.S.-JAPAN WORKSHOP ON DRIFT WAVE TURBULENCE, AUSTIN, TEXAS, JANUARY 11-15, 1982

This workshop was held at the University of Texas and was organized by the Institute for Fusion Studies (IFS) under the agreement between the United States and Japan for the exchange of information in theoretical plasma physics. There were approximately 30 invited scientific participants: 6 from Japan and 24 from the United States. There were six sessions with formal presentations and two sessions for informal discussions of key issues in the problem of drift wave turbulence and anomalous transport.

There were two major goals of the workshop. The first goal was the continuing effort to identify the more plausible anomalous transport mechanisms that take place in high temperature magnetic confinement systems. The second goal was the exchange of recent results between theorists, computer simulationists, and experimenters. Leading scientists representing these three approaches (theory, experiment, and simulation) made presentations reviewing the state-of-the-art in their respective areas. From these presentations, a general sense of understanding emerged as a primary product of the workshop. Some of the problems reported and issues discussed were the following.

The experimenters reported improved resolution in the k,ω space of the measured fluctuations, extension of the fluctuation measurements to new machines, and measurements of magnetic fluctuations in low temperature experiments. Theorists presented alternative explanations for the character of the fluctuation spectra based on renormalized drift wave turbulence theories and the solution of nonlinear dissipative systems exhibiting intrinsic chaotic behavior. In contrast to the weakly correlated turbulence theories, the Japanese emphasized the importance of large-scale correlated structures such as convective cells and solitons. An intermediate point of view of the turbulence was introduced by a theory containing a large number of randomly distributed solitons forming an ideal gas of strongly correlated objects. Simulations were presented by the Japanese of the collisions between drift wave solitons. A theoretical picture containing strong phase space correlations called "clumps" gave an alternative formula for the fluctuation spectrum.

Simulations of drift wave turbulence above (strong gradients) and below (weak gradients) the ion cyclotron frequency and the measured transport of particles and thermal energy were reported by Japan and the United States. A new simulation technique offering the possibility of greatly extended parameter variations and long time runs was also presented.

Discussions on the formulas for anomalous transport centered on the fact that, notwithstanding the importance of empirical scaling laws that synthesize large amounts of experimental data by a particular parameterization, the approach of characterizing the confinement by a formula for the global energy replacement time τ_E is an oversimplification of the issue since transport, atomic physics, and heating mechanisms are interrelated in power balance. The thermodynamic properties of anomalous transport were analyzed.

In a discussion session, the question was debated as to whether it is now timely to assemble the present differentiated areas of knowledge represented at this workshop into an integrated data base giving the present understanding in the field of anomalous transport. Although no consensus was apparent on this issue, there was a sentiment in the direction that the present understanding may well be stronger than generally realized. It is also clear, however, that many new and difficult problems continually emerge, and their solutions will change our understanding of the problem of anomalous transport.

The proceedings of the workshop are available as IFS Report #53.

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REPORT ON THE FOURTH SYMPOSIUM ON THE PHYSICS AND TECHNOLOGY OF COMPACT TOROIDS, LIVERMORE, CALIFORNIA, OCTOBER 27-29, 1981

The Fourth Symposium on the Physics and Technology of Compact Toroids was hosted by Lawrence Livermore National Laboratory (LLNL). Attendees, numbering 80, heard 10 review papers in three morning plenary sessions, and interacted in two afternoon poster sessions where some 45 contributions were presented. There were seven participants from overseas, including six scientists from Japan and one from the Federal Republic of Germany. Immediately following the symposium, a two-day joint U.S.-Japan workshop on compact toroid research was held.