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EDITORIAL

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Special issue: overview and summary reports from the 24th Fusion Energy Conference (San Diego, CA, 8–13 October 2012)

Paul Thomas
ITER Organization

The group of 27 papers published in this special issue of *Nuclear Fusion* aims to monitor the worldwide progress made in the period 2010–2012 in the field of thermonuclear fusion. Of these papers, 24 are based on overview reports presented at the *24th Fusion Energy Conference* (FEC 2012) and three are summary reports. The conference was hosted by the Government of the United States of America and organized by the IAEA in cooperation with the United States Department of Energy and General Atomics. It took place in San Diego on 8–13 October 2012. The overviews presented at the conference have been rewritten and extended for the purpose of this special issue and submitted to the standard double-referee peer-review of *Nuclear Fusion*. The articles are placed in the following sequence: Overview articles, presented in programme order, are as follows:

- Tokamaks
  - DIII-D research towards resolving key issues for ITER and steady-state tokamaks;
  - Overview of the JET results with the ITER-like wall;
  - Overview of ASDEX Upgrade results;
  - Overview of experimental results and code validation activities at Alcator C-Mod;
  - An overview of KSTAR results;
  - Progress of long pulse and H-mode experiments in EAST;
  - Overview of physics results from the National Spherical Torus Experiment;
  - Overview of physics results from MAST towards ITER/DEMO and the MAST Upgrade;
  - An overview of recent HL-2A experiments;
  - Progress of the JT-60SA project;
  - Overview of recent and current research on the TCV tokamak;
  - An overview of FTU results;
  - New developments, plasma physics regimes and issues for the Ignitor experiment;
  - Recent research work on the J-TEXT tokamak.
- Other MCF
  - Extension of operation regimes and investigation of three-dimensional current-less plasmas in the Large Helical Device;
  - Dynamics of flows and confinement in the TJ-II stellarator;
  - Overview of results from the MST reversed field pinch experiment;
  - Overview of the RFX Fusion Science Program;
  - An overview of intrinsic torque and momentum transport bifurcations in toroidal plasmas.

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- ICF
  - The National Ignition Campaign: status and progress;
  - Present status of Fast Ignition Realization EXperiment and inertial fusion energy development.
- Cross device or cross programme topical overviews
  - Energetic particle instabilities in fusion plasmas;
  - Science and technology research & development in support to ITER and the Broader Approach;
  - Multimodal options for materials research to advance the basis for fusion energy in the ITER era.

Conference summaries of the sessions devoted to:

- Magnetic confinement experiments on stability, wave–plasma interactions, current drive, heating, energetic particles, plasma–material interactions, divertors, limiters and the scrape-off layer;
- Magnetic confinement theory and modelling;
- Inertial confinement fusion.

We believe that this issue will be a useful resource for the community and we thank all of the authors and referees for their hard work in preparing the papers for publication.