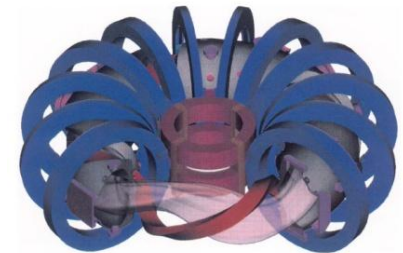
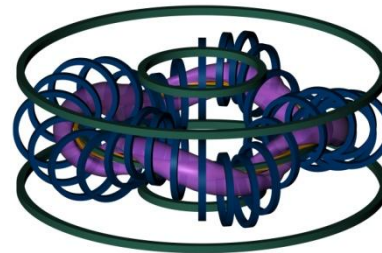
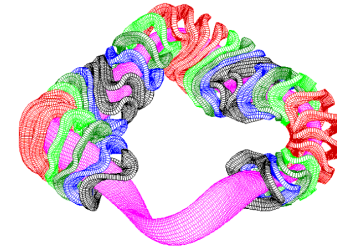
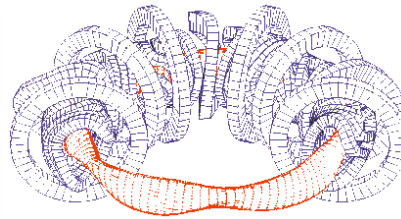
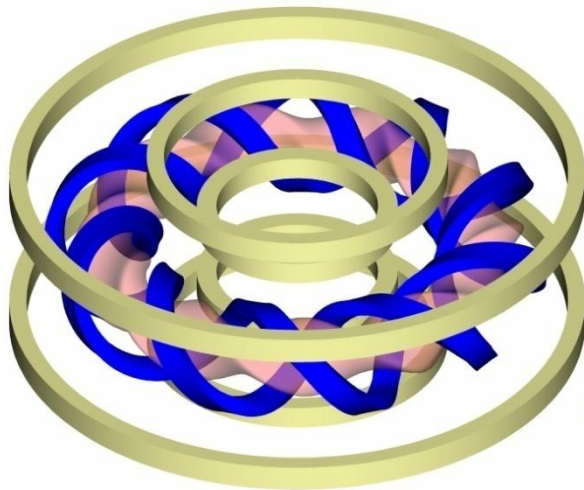


Universität Stuttgart

Coordinated Working Group Meeting (CWGM)

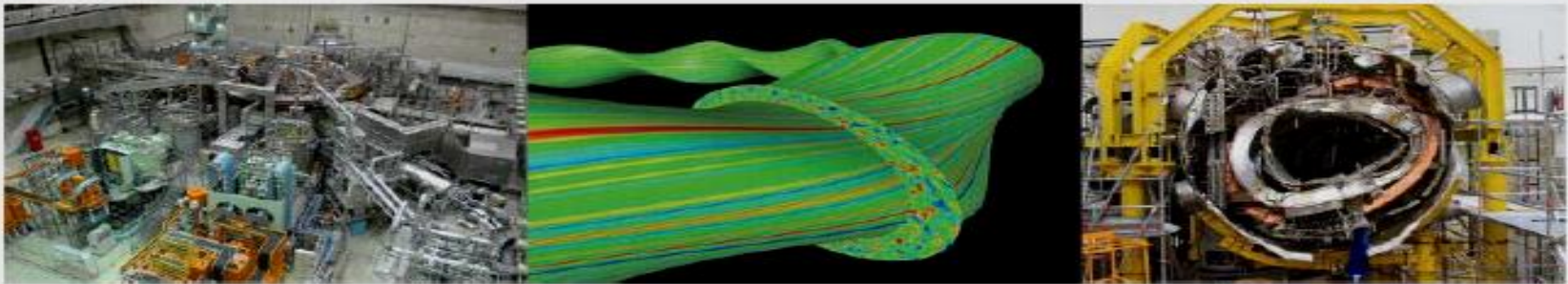
Helical Plasmas: Diversity → Systemization



Joint experiment/database/analysis/papers → scientific systemization

IEA Implementing Agreement for Co-operation in
Development of the Stellarator-Heliotron Concept

Co-operation in Development of Stellarator-Heliotron Concept



Objective

The objective of the co-operation is to improve the physics base of the Stellarator-Heliotron concept and to enhance the effectiveness and productivity of research and development efforts related to the Stellarator-Heliotron concept by strengthening co-operation among Agency member countries.

Scope

The co-operative programme to be carried out by the Contracting Parties within the framework of this Agreement shall consist of the following activities:

1. Exchanges of information;
2. Assignment of specialists to the facilities or research groups of the Contracting Parties;
3. Joint planning and co-ordination of experimental programmes in selected areas;
4. Workshops, seminars and symposia;
5. Joint theoretical, design and systems studies;
6. Exchanges of computer codes; and
7. Joint experiments.

Contracting Parties

International Stellarator-Heliotron Workshop

CWGM (IPP site)

IPP

CWGM (NIFS site)



Stellarator News

Annual Report

Written Agreement

About the IEA

CWGM: Highly evaluated !

**Implementing Agreement for Cooperation in Development
of the Stellarator-Heliotron Concept**

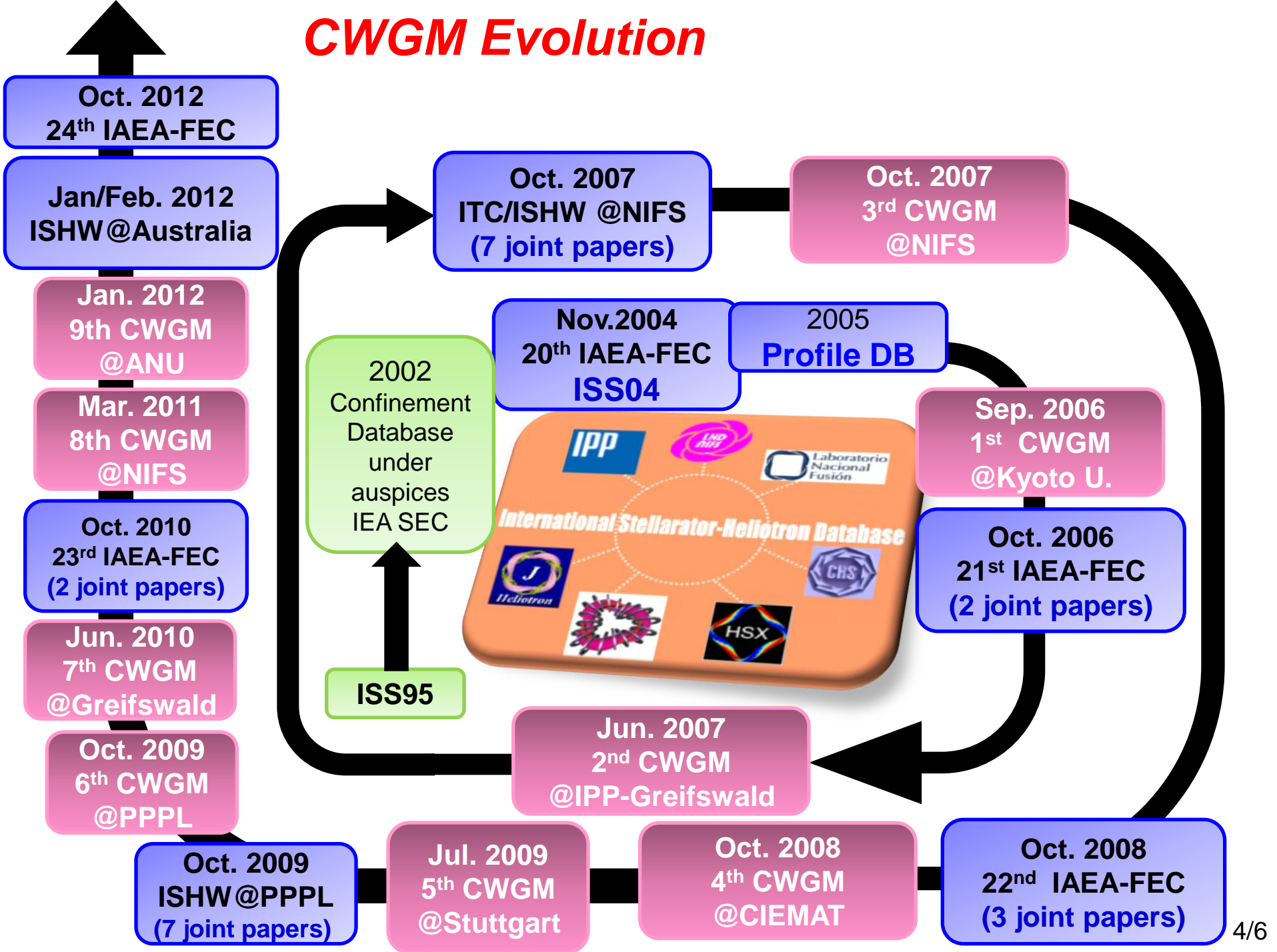
**2011 Executive Committee Annual Report
to the Fusion Power Coordination Committee**

January 2012

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
TABLE OF CONTENTS.....	3
1 JOINT ACTIVITY: COORDINATED WORKING GROUP MEETING (CWGM) FOR STELLARATOR-HELIOTRON STUDIES.....	6

CWGM Evolution



Coordinated Working Group Meeting (CWGM) for Stellarator-Heliotron Studies

8th CWGM at NIFS, Japan, Mar.16-17, 2011

Opening

- LHD 14th campaign
- Neutral compression (partial modification of divertor configuration)
- Schedule of 15th campaign, call for joint experiment

Magnetic Topology

- Model for the interaction of poloidal flow and magnetic islands in LHD
- hysteresis of island transition in LHD
- Biasing experiment in TU-Heliac: remarkable effect of magnetic island on poloidal flow

H mode

- Formation of edge transport barrier in stochastic field region on LHD
- Signatures of turbulence spreading during the H-L back-transition in TJ-II plasmas
- Attempt of an MHD-equilibrium analysis of an H-Mode discharge using vmec2000/diagno

Database Issues

- [CDB] Joint paper (EPS): discriminant analysis (Identification of variables causing clustering in the global energy confinement data)
- [PDB] Progress, Status
- [PDB] Equilibrium data storage, authentication

“3D” in ITPA (T&C)

San Diego (Apr.2-4)

Stellarator-Heliotron representatives (T&C):
C.Hidalgo, K.Tanaka,
A.Dinklage

- Inclusion of 3D expertise in joint experiments and joint actions

Energetic Particles (Kick Off!)

- EP-driven modes (LHD, TJ-II, H-J) -> database formulation
- energetic ion transport and losses by TAEs and other MHD modes
- Theory and simulation, code benchmarking, validation
- beam ions, alphas -> reactor discussion

- 40 experts attended (incl. video conf.), Outreach to ITPA 3D physics session
- 9th CWGM was just held on 28 Jan. 2012 here in Canberra
equilibrium in experiment, energetic particles, fueling and so on.

List of Joint Papers from CWGM activity

[20th IAEA-FEC (2004)]

H.Yamada et al., "Characterization of **energy confinement** in net-current free plasmas using the **extended International Stellarator Database**", NF45(2005)1684.

[15th ISW (2005)]

M.Yokoyama et al., "Common Features of **Core Electron-Root Confinement** in Helical Devices", FST 50(2006)327.

A.Dinklage et al., "Assessment of **Global Stellarator Confinement**: Status of the **International Stellarator Confinement Database**", FST 51(2006)1.

[21st IAEA-FEC (2006)]

M.Yokoyama et al., "**Core electron-root confinement (CERC)** in helical plasmas", NF47(2007)1213.

A.Dinklage et al., "Physical model assessment of the **energy confinement time scaling** in stellarators", NF47(2007)1265.

[16th ISHW/17th ITC (2007)]

E.Ascasibar et al., "**Effect of Rotational Transform and Magnetic Shear** on Confinement of Stellarators", Plasma and Fusion Res., 3 Special Issue (2008)S1004.

K.McCarthy et al., "Comparison of **Impurity Transport** in Different Magnetic Configurations"

Y.Feng et al., "Comparative **Divertor-Transport** Study for W7-AS and LHD (EMC3/EIRENE)"

M.Kobayashi et al., "**Impurity Retention** Effect in the Edge Ergodic Layer of the Large Helical Device", Plasma and Fusion Res., 3 Special Issue (2008)S1005.

A.Weller et al., "Extensions of the International Stellarator Database by **High- β** Data from W7-AS and LHD"

A.Dinklage et al., "Status of the International **Stellarator/Heliotron Profile Database**"

H.Funaba et al., "Data Structure for LHD Plasmas in the **International Stellarator/Heliotron Profile Database**"

K.Nagasaki et al., "**ECCD** Experiments in Heliotron J, TJ-II, CHS, and LHD", J.Plasma and Fusion Res., 3 Special Issue (2008)S1008.

[22nd IAEA-FEC (2008)]

Y.Feng et al., "**Comparative divertor-transport study** for helical devices", NF49(2009)095002.

R.Burhenn et al., "On **impurity handling** in high performance stellarator/heliotron plasmas", NF49(2009)065005.

A.Weller et al., "**International Stellarator/Heliotron Database** progress on **high-beta confinement and operational boundaries**", NF49(2009)065016.

[17th ISHW (2009)]

M.Hirsch et al., "Overview of **LH-transition** experiments in helical devices", Contributions to Plasma Physics, 50, Issue6-7(2010)487.

T.Akiyama et al., "Status of a stellarator/heliotron **H-mode** database", Contributions to Plasma Physics, 50, Issue6-7(2010)590.

H.Funaba et al., "**Data Servers** for the International Stellarator/Heliotron Profile Database (ISHPDB)"

S.Sakakibara et al., "Remarks on **Finite Beta Effects** in International Stellarator/Heliotron Scaling"

Y.Narushima et al., "Experimental study of effect of poloidal flow on stability of **magnetic island** in LHD", Contributions to Plasma Physics, 50, Issue6-7(2010)529.

D.Pretty et al., "Results from an international **MHD data mining** collaboration"

M.Ramisch et al., "Investigation of **Turbulent Transport and Shear Flows** in the Edge of Toroidal Plasmas", Contributions to Plasma Physics, 50, Issue8(2010)718.

[23rd IAEA-FEC (2010)]

M.Hirsch et al., "**H-mode** in Helical Devices"

Y.Narushima et al., "Experimental Study of Poloidal Flow Effect on **Magnetic Island Dynamics** in LHD and TJ-II", NF 51(2011)083030.

[EPS (2011)]

A.Kus et al., "Identification of variables causing clustering in the **global energy confinement** data by use of discriminant analysis"

[APS (2011)]

C.Hegna et al., "Healing of **magnetic islands** in stellarators by plasma flow" (*invited talk*)

Y.Narushima et al., "Behavior of poloidal rotation during transition of **magnetic island dynamics** in LHD"

[18th ISHW (2012)]

M.Yokoyama et al., "Towards **Validation of Confinement Performance Prediction** Based on the **International Profile Database** (Coordinated Working Group)" (*invited talk*)

D.A.Spong et al., "Energetic particle physics and Alfvén instabilities in 3D configurations"

C.Hegna et al., "Healing of magnetic islands by plasma flow in stellarators" (*invited talk*)