

On the memorial occasion of 10th CWGM

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

2005 Oct.	Informal meeting for a kick-off in Madrid
2006 Sep.	1st CWGM in Kyoto
2007 Jun.	2nd CWGM in Greifswald
2007 Oct.	3rd CWGM in Toki
2008 Oct.	4th CWGM in Madrid
2009 Jul.	5th CWGM in Stuttgart
2009 Oct.	6th CWGM in Princeton
2010 Jun.	7th CWGM in Greifswald
2011 Mar.	8th CWGM in Toki
2012 Jan.	9th CWGM in Canberra
2012 Jun.	10th CWGM in Greifswald

Agenda for informal meeting on STELLDB at Greifswald in 2003

1. What we should do (Needs)

(1) Definition of goal : derivation of a new scaling law, release of database, publication, etc.

(2) Substantial work in the nearest future

Incorporation of new parameters (iota23, kappa, etc..)

Incorporation of new data (TJ-II, W7-AS, LHD, Helitron J...)

Check quality of available data

(3) Further prospect

profile database

possible collaboration (comparison of dimensionally similar discharge, etc..)

2. How we should do the items mentioned above. (Way)

(1) Physical approach to derive a unified scaling

model, hidden parameters, selection of subset

(2) Technical issues

3. Schedule

(1) Incorporation of new data

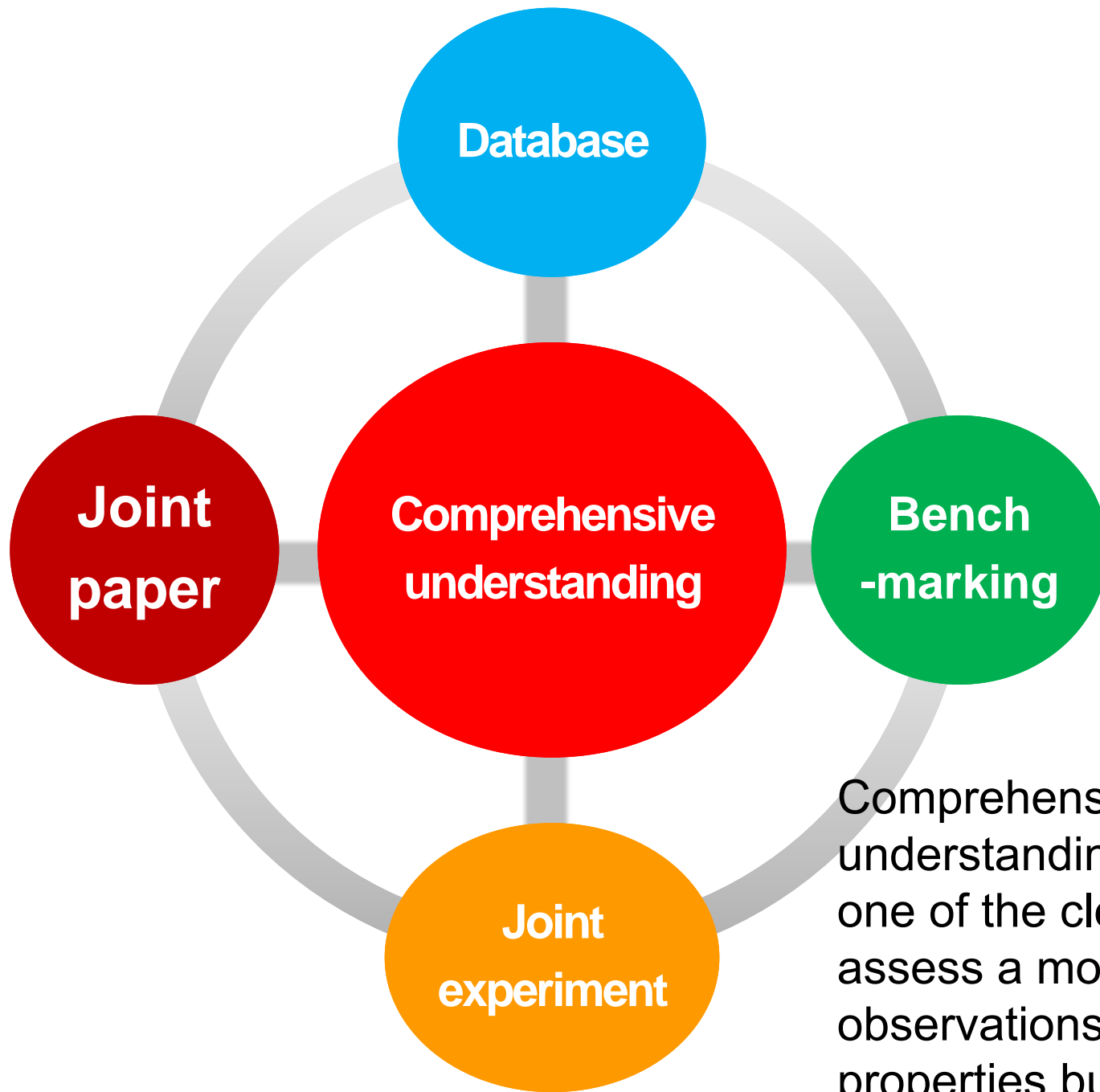
(2) To submit the paper at the next IAEA Fusion Energy conference.

→ ISS04

From Minutes 33rd Stellarator Executive Committee meeting
Villamoura, 1 November 2004-11-21

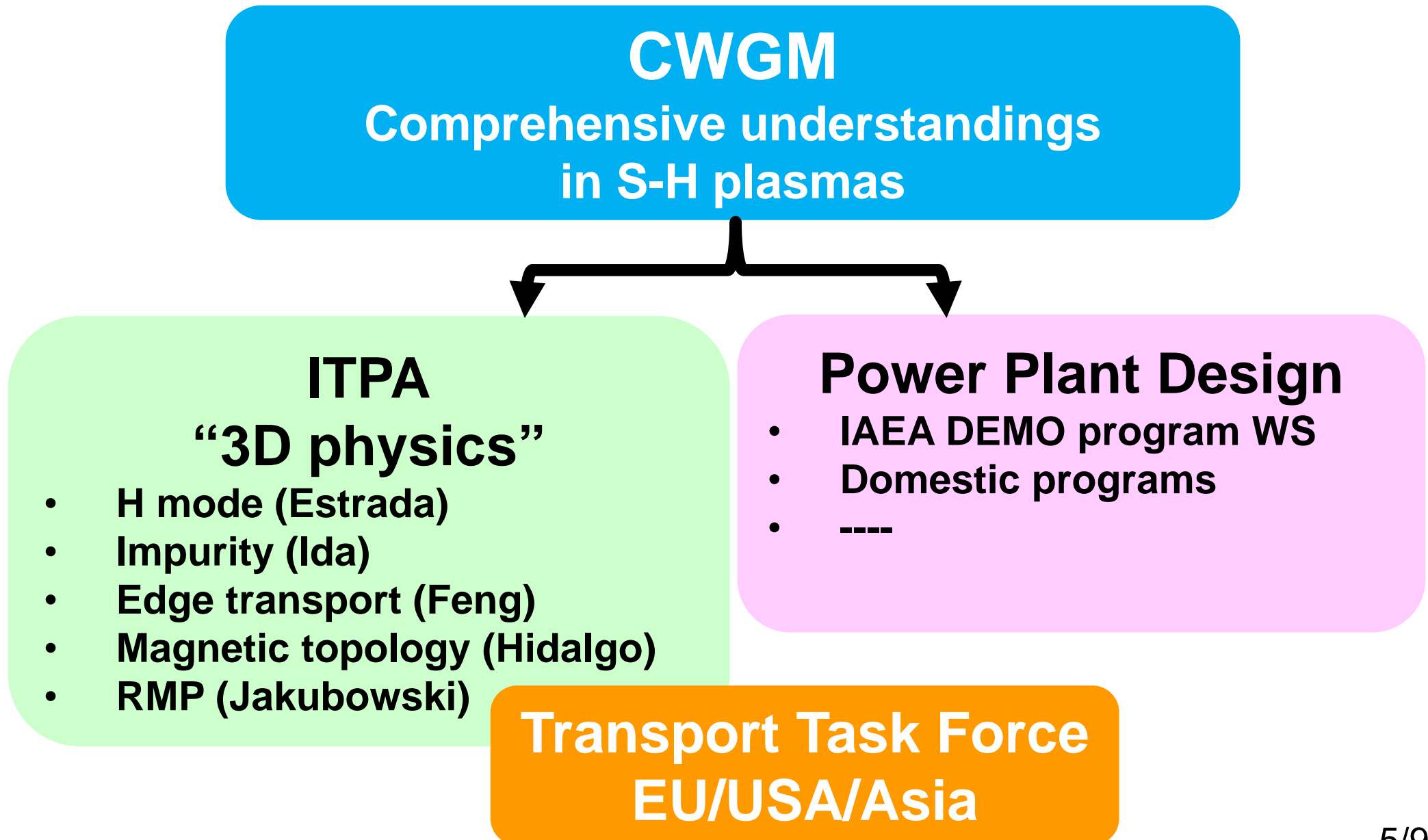
We should identify priorities in the development of stellarator working groups. Furthermore, priorities in working group activities and strategies should be developed for the stellarator community, taking into account the status of ITER and perspectives for DEMO (i.e. fast track versus improved confined concepts). To promote and develop the stellarator strategy, and we should make use of stellarator workshops to promote general discussions (and working group to produce joint products) .

1. Complementary role of ISHW and CWGM
2. Why do we need to work together ?
 - Share the goal
 - Accelerate the wheel of output-outcome
3. Front-loading for the next step
 - LHD DD experiment
 - W7-X Start experiment in 2015
 - Realistic research plan
 - DEMO IAEA DEMO program WS series



Comprehensive and exact understanding of complex physics, one of the cleverest ways is to assess a model by comparing observations with very different properties but with same high scientific quality.

CWGM is an outstanding platform for international joint works and can be an excellent light house for global / domestic programs as well.

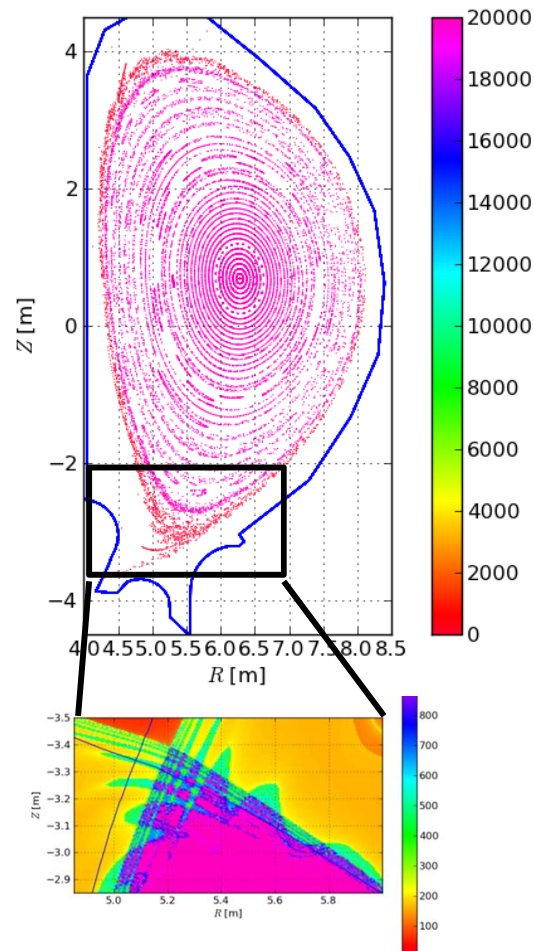


Joint research for RMP and ELMs

Stochasticity of magnetic field lines is also important issue in tokamaks.

➔ **One critical issue: RMP to ELM mitigation/suppression**

Ex: 3D field in ITER



To understand how the RMP mitigates or suppresses the ELM, the identification of magnetic field structure is necessary.

International collaboration between LHD and DIII-D has started

1. Identification of magnetic topology observing heat plus propagation,
2. Identification of plasma boundary observing radial electric field,
3. Tomography of magnetic islands by fast camera coupling 3D MHD modeling.

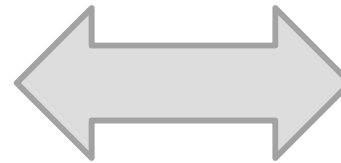
Bilateral joint experiments

Bilateral share in common database



LHD project is stepping up to a new stage

1. Upgrade of heating power
2. Closed helical divertor
3. Deuterium experiment



Exploration of physics in depth and width

CY		2011	2012	2013	2014
JFY		2011	2012	2013	2014
Exp. Camp.		15th	16th	17th	18th
NBI	Tangential	16 MW		←	
	Perpendicular	13 MW	←		→18 MW
ECH	Max	3.7MW	4.5MW		→6 MW
	CW	0.5MW	0.8MW		→1 MW
ICH	Max	2 MW	3 MW		→6 MW
	CW	1 MW	1.5 MW		→3 MW
Divertor	Baffle & Dome	2/10	8/10		→10/10
	Cryo-pump	0/10	1/10		→10/10



LHD Experiment Theme Groups and Leaders

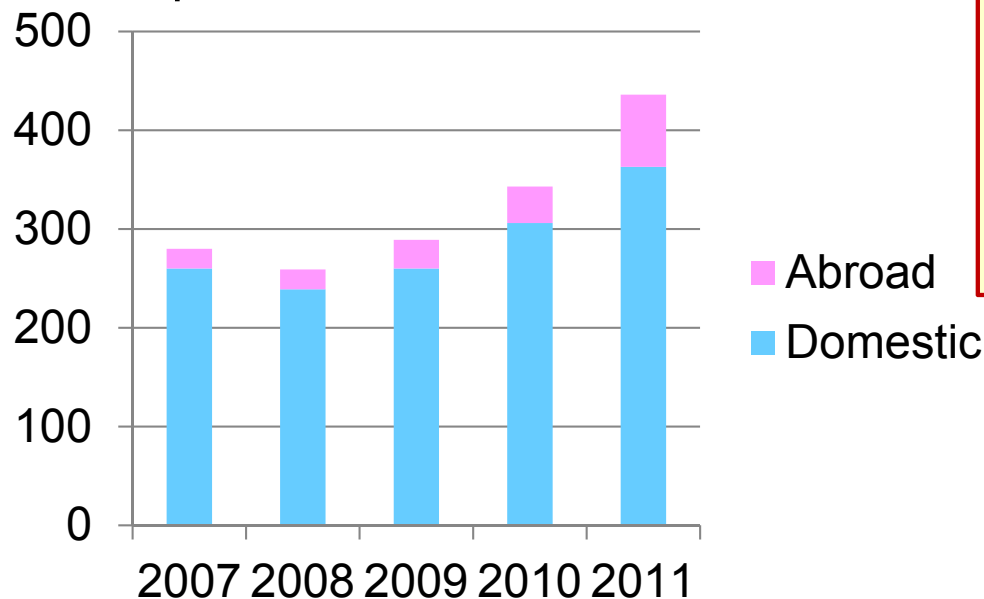
	Experiment Theme Group	Co-leader	Sub-leader
1	Divertor and edge plasma physics	S.Masuzaki N.Ohno (Nagoya Univ.)	T.Akiyama G.Motojima
2	High- β and MHD physics	S.Ohdachi M.Furukawa (Univ. Tokyo)	Y.Narushima H.Tsuchiya
3	Extension of high-temperature regime	K.Nagaoka S.Murakami (Kyoto Univ.)	H.Takahashi H.Nakano
4	Steady state operation and plasma wall interaction	H.Kasahara, M.Tokitanki K.Nagasaki (Kyoto Univ.) Y.Ueda (Osaka Univ.)	Y.Yoshimura N.Ashikawa
5	Transport / Atomic & molecular process	K.Tanaka, C.Suzuki S.Inagaki (Kyushu Univ.) M.Hasuo (Kyoto Univ.)	M.Yoshinuma M.Goto
6	Heating physics	M.Osakabe K.Nagasaki (Kyoto Univ.)	T.Seki H.Igami
7	Device engineering experiment	S.Hamaguchi	H.Chikaraishi



Why don't you join LHD exp. ?



Participants are increasing, in particular, from abroad.



16th experimental campaign in 2012

from Aug.29 to Nov.22

Please take a look of

<http://www.lhd.nifs.ac.jp/en/>

249 experiment proposals

21 lead by scientists from abroad