## CONTENTS

1: INVIT	ED PAPERS		
	Materials for Advanced E	nergy Systems	1
		Shiori Ishino	
	A Conceptual Design of A	A Small Tokamak as A Volumetric	
	Neutron Source (VNS)		12
		Qiu Lijian, G.S.Luan, Z.J.Gou, Q.)	Ku, P.Duan
		X.H.Gao, Y.Wu, Y.C.Wu, L.L.Liu,	Q.Y.Huang
		B.J.Xioa and Y.W.Yang	Ŭ
	Outline of ITER/EDA	-	19
		Kenzo Miya	
	Some Characteristics of	Microstructural Evolution under	
	Irradiation		23
		Yu Jinnan, W.V.Sommer, J.N.Bra	dburv.
		W.F.Green and M.Victoria	, , , , , , , , , , , , , , , , , , ,
	R & D Activities on Advar	nced Composite Materials for	
	Fusion in Japan		
	· · · · · · · · · · · · · · · · · · ·	Akira Kohvama	
2: SYS	TEM & DESIGN		
	Status of Fusion Reactor	Design Activity in JAERI	43
		Yasushi Seki	
	The Prospects of HTGR	in China	51
	·	Wu Zhongxin and Tong Yunxian	
	Status of LHD and Force	Free Helical Reactor (FFHR)	
		Akio Sagara and O. Motoiima	
	Status of IFMIF and ESN	IIT Activities	63
		Kenii Noda, T.Kondo, Y.Kato, M.S	Suaimoto.
		Y.Ovama, S.Hamada, T.Kikuchi,	T.Usui.
		H.Katsuta, H.Ohno and S.Funaha	ashi
	Advanced Energy Conve	ersion Systems	69
	havanood Enorgy conve	Kivoshi Yoshikawa, Y Yamamoto	H Toku
		and M Ohnishi	, mitoria,
	Status of HTGR and Ite I	Materials Development in Japan	74
		Motokuni Eto	/ -+

Advanced High Heat Flux Transfer Technology	80
Saburo Toda	
Status of Core Material Development for Fast Reactor in J	apan81
Shigeharu Ukai, I. Shibahara an	d S. Nagai
Experiment Hybrid Blanket Conceptual Design	87
Wu Yu and Qiu Lijian, B.J.Xiao,	Y.C.Wu
and W.Y.Wu	
Waste Transmutation and Nuclear Energy Generation	
Using a Tokamak Fusion-Fission Hybrid Reactor	95
Wu Yican and L.J.Qiu	
Shielding Materials by Recycling of Low Level Radioactive	•
Materials from Nuclear Facilities	101
A.Umemura, K.Kimura, K. Takał	nashi,
D.Sakurai, S.liboshi, M.Yamamo	oto and S.Abe
Evaluation of Electromagnetic Loading during Plasma Disi	ruption
and VDEs	
Yoshikatsu Yoshida, Y.Aizawa,	K.Demachi
and K.Miya	
Plasma Facing Components for Helical Reactors	114
Akio Sagara and O.Motojima	
Research and Development for New Hydrogen Energy	119
Naoto Asami and K. Matsui	
Isotope Separation for Fusion Energy	123
Ichiro Yamamoto and A.Kanaga	wa
Ŭ	
3: BLANKET & FIRST WALL TECHNOLOGY	
Status of Tritium Technology in Japan	125
Satoru Tanaka and K.Okuno	
Tritium Technology of Hybrid Reactor in SWINPC	
Sun Ying	
Recent Development of Tritium-Material Interaction	
Studies in Japan	136
Kuniaki Watanabe	
Performance of Boron and Silicon Compounds/Carbon	
Materials	143
Dai Sho-hui, Yang Youging, Ya	o Yuming,
Li Qiong and Shing Zhonggi	

Sodium Loop and Testing	of Mechanical Properties	144
	Song Xiuqin, Zhing Xilin, Liu Chu	nying
	and Wu Luyuan	
Preparation and Characte	eristics of Chemical Vapor	
Deposition C+SiC Coatin	g on Graphite	150
	Yao Yiming, Li Qiong c. long, Xin	g Zhonghu,
	G.Li, Y.Pan, D.Gao and Dai Shou	uhui
Neutron Radiation Effects	s in Copper and Copper Alloys	151
	Takeo Muroga, H.Watanabe and	N.Yoshida
Dynamic Behavior of Hyc	Irogen Isotopes Implanted into	
Graphite		156
	Kenji Morita and B.Tsuchiya	
Analysis of Hydrogen Tra	anport Through Plasma Facing	
Materials		162
	Wei Mi Shu and Y. Hayashi	
Hydrogen Interaction with	n Beryllium	168
	Tetsuo Tanabe, K.Kizu and T.Kir	iyama
The Design of HTR-10		169
-	Sun Yuliang, Zhong Daxin and C	in Zhenya
Plasma Surface Interacti	on Studies in Japan	170
	Tomoaki Hino, Y. Hirohata and T	Yamashina
Heat Transfer Problems	in the Pebble-Bed Blanket of the	
Fusion-Fission Hybrid Re	eactor	176
	Liu Cheng-an	
Tritium Barrier Material S	Study in China	180
	Q.R.Huang, Ch.Q.Shan, Y.Sh.G	uo
	and J.J.Du	
Simple Devices for Meas	suring High Concentration Tritium	187
	Kuniaki Watanabe, M. Matsuyan	na
	and T. Yamazaki	
Experiments of Neutron	Multiplication in Lead	194
	Wenmian Jian, Yuan Chen, Ron	g Liu,
	Haiping Guo and Jian Shen	
Development of Refracto	ory High Z Metals for Plasma Facil	ng
Component Applications	i	199
	Hiroaki Kurishita, Y.Kitsunai, H.H	Kayano,
	Y.Hiraoka and K.Takebe	

	Development of Compact	Tritium Confinement System	
	Using a Gas Separation M	lembrane	205
	-	Takumi Hayashi and K.Okuno	
	Behaviors of Carbon Borid	le/Copper Alloy	209
	1	Dai Shou-hui, Yao Yiming, Xing Zh	nonghu
	;	and Sheng Zhongqi	
	Resistance to Thermal Sh	ock of Alumina Ceramic and	
	1Cr-18Ni-9Ti Stainless Ste	eel Bonding	210
		H.Q.Hao, Y.L.Wang, Z.H.Jin and X	(.T.Wang
	Microstructure of Graphite	/Cu Joint Interface and Its Evolution	n
	under Irradiation		215
		H.Watanabe, T.Sato, Y.Miyamoto,	T.Muroga,
		Naoaki Yoshida and M.Akiba	
	A Novel Conceptual Desig	n of Divertors with United Function	n of
	Gaseous Puffin and Electr	romagnetically Plug	216
		G.S.Luan, B.J.Xiao and X. Q.Cher	า
	Plasma Transport in Diver	tor Region and Stress Analyses	
	of Divertor Plate for a Tok	amak Reactor	222
		Shi Han-wen, Xie Zhongyou, Gao	Binyan
		and Hu Gang	
	Behavior of Developed Ra	adiation Resistant Optical Fibers	
	in a Variety of Irradiation E	Environments	229
		Tsunemi Kakuta, T.Shikama, M.N.	arui,
		T.Sagawa, H.Kayano, K.Sanada	
		and N.Shamoto	
	A Summary of Benchmark	k Experiments for Simulation of	
	Fusion Reactors Using Ar	n Annular Blanket with a Line	
	D-T Source		235
		Hiroshi Maekawa, Y. Oyama and	M.A. Abdou
4: FUSI	ON MATERIALS		
	Status of Blanket Material	ls R & D in Japan	247
		Takayuki Terai	
	Magnetohydrodynamic Pr	ressure Drop Study at LMEL	255
		J.P.Qian, Z.Y.Xu, J.M.Chen, W.H.	.Jiang,
		C.J.Pan and W.Z.Li	

Studies on Fusion Materia	als in Japan	261	
	Katsunori Abe		
Studies on Radiation Dan	nage of Nuclear Ceramics in Japa	n265	
	Chiken Kinoshita		
R & D of Vanadium Alloys	s for Fusion in Japan	271	
	Hideki Matsui		
In-Situ Study of Radiation	Effects in Ceramic Insulators in		
JMTR Fission Reactor		277	
	Tatsuo Shikama, M.Narui, T.Saga	awa, T.Kakuta	
	and H.Kayano		
The Development of New	Modification of INCONEL 718	284	
	Shou-hua Zhang, Xishan Xie, Jia	nxin Dong,	
	and Mengzhe Chen		
Interactions of Fuel Partic	les with Fusion Reactor Materials		
	M. Yamawaki and Kenji Yamaguo	chi	
Preparation of C Fiber/Si	C and SiC Fiber /SiC		
Composites by CVI for Lo	Composites by CVI for Low Activation		
	Tetsuji Noda, H.Araki and H.Suzu	ıki	
Isotope Separation of Si I	by Infrared Multi-Photon		
Decomposition (IRMPD)		297	
	Hiroshi Suzuki, H.Araki and T.No	da	
Investigation on the Irrad	iation Damage Behavior of a Nove	el	
Oxide Dispersion Strengt	hened Ferritic Steel (ODS Steel)		
	Hu Ben-fu, Wu Chengjian and H.	Takahashi	
An Overview of Several I	ron Base Oxide Dispersion Streng	thened	
Alloys for Nuclear Applica	ations	307	
	Tian Yun, Shan Bingquan, Liu Gi	Jangzu,	
	Pan Qing Chun, Sun Jiquang and	d	
	Zhao Zhuoyong		
Effects of Irradiation on Microstructural Evolution in an Oxide Dispersion			
Strengthened Vanadium	Alloys		
	Tamaki Shibayama, K.Nakajima	and H.Kayano	
Strength and Toughness of Tungsten-Stabilized			
Ferritic/Martensitic Steels for Fusion Reactor			
	Fujio Abe		

R & D of Low Activation F	Ferritic Steels for Fusion in	
Japanese Universities		325
	Yutaka Kohno, A. Kohyama and H	K.Asakura
Development of Low Acti	vation Ferritic Steel for	
First Wall (F82H)		
	Kazuhide Takahashi and M.Tamu	Ira
The Effects of Hot-Pressi	ng Parameters on Microstructures	
and Properties of Boron	Carbide Pellets	
	Wang Yong-lan, Yang Jianfeng, (	Gao Jiqiang
	and Jin Zhihao	
Study of Fuel Cladding-S	team Reaction under	
a Loss-Of-Coolant-Accid	ent (LOCA)	
	Sun Yuan-zhen, Chen Wang Chu	ท
	and Bi An Tai	
The Effect of Nickel and	Phosphorous on Neutron Irradiatio	n
of Weld Metal of RPV Sto	eels	343
	Yang Wen-dou and Wu Yong-ger	n
Calculation of Radiation	Induced Deformation in the LWR	347
	Johsei Nagakawa, N. Yamamoto	and Y. Murose
Thermal Fatigue of 304L	Steel	352
	J.M.Chen, Z.Y.Xu, C.J.Pan, W.H.	.Jiang,
	M. Ma and J.P.Qian	
Study of Fabrication Tec	hnology and Performances for	
HTGR Fuel Element		358
	Yang Youqing, Dai Shouhui, Qiu	Bangchen,
	Zheng Zhenhua and Xie Huaiying	g
The Influence of He on H	ligh Temperature Strength of	
Fe-15Cr-20Ni Austenitic	Stainless Steels for Fast Reactor	
Applications		359
	Akira Hasegawa, K.Abe, M.Satou	u, Y.Kudoh,
	B.Briyatomoko and N.Masuda	
Ion Irradiation Study on	Radiation Embrittlement of	
Pressure Vessel Steels		
	Takeo Iwai, N.Sekimura and S.Is	hino

## 5: RADIATION DAMAGE ANALYSIS

A Simulation Study of Ra	diation Damage in Solids by	
Energetic Electron		
	Li Wen-zhi and He Jian-li	
The Role of Nitrogen in S	Swelling of 316 Stainless Steel	374
-	Akira Naito, N.Eguchi, E.Nishibe,	
	H.Saikawa and N.Igata	
Study of Helium Bubble I	Formation in 316L Stainless Steel a	at Different
Temperatures		
	Chen Ke-gin, C.H.Zhang, Y.S.Wa	ing
	and J.G.Sun	U U
Microchemical Change a	nd Grain Boundary Migration	
due to Excess Defects Fl	low under Irradiation	
	Heishichiro Takahashi, N.Hashim	oto
	and S.Watanabe	
Radiation Damage in the	First Wall of Fusion Reactor	
Caused by Fusion Alpha	-Particles	
	Huo Yu-kun, Zheng-Ying Pan, Qi	-Yun Shao,
	Rong-Wu Li and Neng-Ping Wang	<b>a</b>
Positron Annihilation Life	time Study of Irradiated	-
Fe-Cu Alloys	-	
-	Fuminobu Hori, Y.Kamimura, Y.J.	.Aixin,
	M.Takenaka and E.Kuramoto	
Irradiation Swelling and	Atomic Bond of Alloys	
Ŭ	Sheng Zhongqi	
The Microstructure of Fe	-17Cr-14Ni-2Mo Austenitic Stainles	SS
Steel after Irradiation		400
	Sheng Zhong-qi, Xiao Hong, Pen	g Feng,
	Ti Zhingxin and Dai Shouhui	0
Concept of Cascade Loc	alization Induced Bias Effect on M	icrostructural
Evolution		401
	Toshimasa Yoshiie and M.Kiritan	i
Microstructural Evolution	in Fe-Cr-Ni Alloy under Variationa	1
Temperature Irradiation		407
	Qiu Xu, H.Watanabe, T.Muroga a	and N.Yoshida

Solid Transmutation Eff	fects in Fusion Reactor Materials	413
	Somei Ohnuki, H.Kinoshita and	H.Takahashi
Computer Simulation o	f Bias Factor and Void Swelling in	
Metals		417
	Eiichi Kuramoto and T.Tsutsurr	i
Radiation Damage Stu	dies on Fusion Reactor Materials i	n JAERI
Ū		421
	Akimichi Hishinuma	
High Energy Heavy lor	Irradiation Effects on Electron Tra	ansport
in Oxide Superconduct	ors	
<b>F</b>	Mititaka Terasawa	
The Function of Instrur	nented Impact Testing Machine ar	nd Its
Domestic Matching Au	tomatic Testing Device	
2 official matching r la	Yang Wen-dou and Jia Xueiun	
Development of Irradia	tion Techniques for Fundamental	
Studies on Materials in		434
oracios on materials in	Minoru Narui T Sanawa T Shi	kama H Kavan
	and M Kiritani	nama, mayam
Small Specimon Testir	and M.Kintan	440
Small opecimen resul	Shiro litsukawa	
Microstructural Evolution	on of Defect Clusters in Neutron	
		449
maulateu MyO+IAI2O	3 Kan jahi Eukumata, C Kinashit	
	X Wetenuki and K Nekei	a, S.Maeua,
Data Sustam of Trans	f. Watahuki ahu K. Nakai	
Nuclear Material Desir		A E A
Nuclear Material Desig	JII Miteutopo Eulito, T. Nodo opd. I	404
The Microstructure An	Mitsularie Fujila, T. Noda and F	$\frac{1}{2} = \frac{1}{2} = \frac{1}$
The Microstructure And	arysis of Stress Corrosion Cracked	1 ZIICalOy-4 (ZI-4
Tubing by todine	Vers Kesi Mers Versler	
	Yang Ji-cai, wang Yong Lan, V	Jao Sheny Qua
Implicition Appleted Of	and Hen Jul Yan	
Irradiation Assisted Sti	ress Corrosion Cracking (IASCC)	400
Studies in Japan	Talesse: Taulo de	466
	Takashi Tsukada	
Radiation Damages in	TiAI Intermetallic Alloys	
	Akira Kohyama, T.Yamada, M	.Ogawa, H.Mats
	and M.Narui	472

List of Participants:

.....479