

Volume 2***Section E: Magnet and Related Power Supplies***

Switching circuit for generating fast field transients in superconducting coils <i>M. Darweschsad, P. Komarek, G. Nöther, C. Sihler, A. Ulbricht, W. Weigand, F. Wüchner</i>	999
In-situ shear/compression testing of organic insulators after reactor irradiation at 4 K <i>H. Gerstenberg, E. Krähling, H. Katheder, R. Maix, M. Söll</i>	1003
Determination of compound properties for superconducting magnets by combined theoretical and experimental method <i>H. Kronhardt, K.-D. Herrmann, W. Broocks, M. Pillsticker</i>	1007
Behaviour of polyimide insulated wire in pressurized hot water <i>L. Drews, U. Braunsberger, B. Giesen, M. Poier</i>	1011
Operation of the Upgraded TOSKA facility and test results of the EU-LCT coil cooled with forced flow helium II at supercritical pressure <i>M. Darweschsad, G. Dittrich, A. Grünhagen, S. Fink, G. Friesinger, A. Götz, R. Heller, W. Herz, A. Hofmann, P. Komarek, O. Langhans, W. Lehmann, W. Maurer, I. Meyer, G. Nöther, G. Perinic, W. Ratajczak, H.P. Schittenhelm, G. Schleinkofer, K. Schweikert, Ch. Sihler, E. Specht, H.J. Spiegel, M. Süßer, A. Ulbricht, A. Völker, F. Wüchner, G. Zahn, V. Zwecker</i>	1015
Structural and mechanical design of cryogenic support system for LHD <i>H. Tamura, S. Imagawa, H. Hayashi, T. Satow, J. Yamamoto, O. Motojima, T. Takahashi, K. Asano, S. Suzuki and LHD Group</i>	1019
Design and components test results of the superconducting current feeder system for the LHD <i>S. Yamada, T. Mito, H. Chikaraishi, R. Maekawa, S. Tanahashi, S. Kitagawa, K. Nishimura, T. Uede, H. Hiue, Y. Yasukawa, I. Itoh, K. Sakaki, T. Satow, J. Yamamoto, O. Motojima and LHD Group</i>	1023

Accuracy of superconducting helical coils for LHD <i>S. Imagawa, S. Masuzaki, N. Yanagi, S. Yamaguchi, T. Satow, J. Yamamoto, O. Motojima, LHD Group, K. Nakanishi, K. Uchida, T. Yamagiwa, T. Yamamoto, K. Asano</i>	1027
Local stress analysis of the W7-X superconducting winding pack <i>N. Jaksic, J. Simon-Weidner, J. Sapper</i>	1031
On modular coils of a helias reactor <i>E. Harmeyer, N. Jaksic, J. Simon-Weidner</i>	1035
Test results of the EU subsize conductor joints for ITER <i>D. Ciazynski, P. Decool, B. Jager, A. Martinez</i>	1039
Simulating the ITER TF magnet with the TF model coil adjacent to the LCT coil <i>P. Libeyre, P. Decool, B. Turck, B. Dolensky, R. Meyer, S. Raff</i>	1043
Fabrication of prototype conductors for ITER TF model coil <i>S. Conti, R. Garrè, S. Rossi, A. della Corte, M.V. Ricci, M. Spadoni, G. Bevilacqua, R. Maix, E. Salpietro</i>	1047
Automatic welding of the ITER-CSMS superconductor sheath <i>A. Laurenti, E. Bisio, P. Gagliardi, N. Scontrino, C. Aldrighi, G. Nardoni, G. Bevilacqua, E. Salpietro</i>	1051
Comparison among reduction and compensation methods of reactive power control for the ITER AC/DC converter system <i>E. Gaio, R. Piovan, V. Toigo, I. Benfatto</i>	1055
The switching network and discharge circuit of ITER <i>B. Bareyt, I. Benfatto, P.L. Mondino, A. Roshal, T. Bonicelli, A. Maschio, D. Hrabal, J.M. Bottreau, S. Bulgakov, V. Kuchinski, N. Mikhailov</i>	1059
Status of the ITER central solenoid and toroidal field model coil program <i>K. Okuno, R. Vieira, D. Bessette, N. Mitchell, P. Bruzzone, Z. Piec, R.J. Thome, E. Salpietro, H. Tsuji, S. Egorov, R. Jayakumar</i>	1063
A segmented, alternative, central solenoid design for ITER <i>D. Bessette, B. Stepanov, V. Vasiliev</i>	1067
ITER tokamak supports: initial sizing and design <i>R. Gallix, C. Sborchia, P. Barabaschi, G. Johnson</i>	1071
Mechanical structures for the ITER magnet system <i>C. Sborchia, R. Gallix, N. Mitchell, K. Okuno, B. Stepanov, R.J. Thome, K. Yoshida, F. Wong, P. Barabaschi, C. Jong, A. Alekseev, A. Malkov, P. Titus</i>	1075

The ITER thermal shields <i>R. Bourque, A. Alekseev, M. Wykes</i>	1079
Development of Nb ₃ Al coil for the ITER TF magnet <i>T. Ando, N. Koizumi, T. Ito, H. Nakajima, Y. Nunoya, M. Sugimoto, M. Nakahira, H. Tsuji, H. Tsukamoto</i>	1083
The harmonic power filters of the JET poloidal divertor field amplifiers <i>T. Bonicelli, M. Huart, P. Doyle, M. Rouleau, G. Zullo</i>	1087
The JET high voltage power distribution, analysis of present and future operational requirements <i>N. Dolgetta, E. Bertolini, M. Huart, G. Murphy</i>	1091
Upgrading the JET toroidal field to exceed 3.45 Tesla <i>J.R. Last, E. Bertolini, M. Buzio, P. Presle, R. Raimondi, V. Riccardo</i>	1095
Inspection techniques for JT-60 toroidal field coil cooling pipes <i>T. Arai, M. Honda, T. Koike, M. Saidoh, M. Shimizu</i>	1099
Design and development of sliding joints for the MAST toroidal field coils <i>G.M. Voss</i>	1103
Control of highly vertically unstable plasmas in TCV with internal coils and fast power supply <i>A. Favre, J.-M. Moret, R. Chavan, A. Elkjaer, D. Fasel, F. Hofmann, J.B. Lister, J.-M. Mayor, A. Perez</i>	1107
The central solenoid of ignitor: design and manufacturing aspects <i>G. Galasso, L. Lanzavecchia, J. Rauch, A. Cucchiaro, A. Pizzuto</i>	1111
Selection of jacket materials for Nb ₃ Sn superconductor <i>F.M.G. Wong, N.A. Mitchell, R.L. Tobler, M.M. Morra, R.G. Ballinger, H. Nakajima</i>	1115
Simulation of the power supply system for the TJ-II Spanish stellarator <i>J. Acero, A. Perez, J.M. del Rio, C. Lucia, B. Alberdi</i>	1119
 <i>Section F: Fuel Cycle and Tritium Processing Systems</i>	
Status of ITER fuelling and wall conditioning system design <i>H. Nakamura, G. Federici, P. Ladd, G. Janeschitz, J. Andres, A. Antipenkov, K.J. Dietz, P.W. Fisher, M.J. Gouge, H.S. Hurzlmeier, R.A. Marrs, D. Mitin, K.M. Schaubel, M. Sugihara</i>	1125
High repetitive pellet injectors for plasma density control <i>P.T. Lang, P. Cierpka, P. Kupschus</i>	1129

High speed pellet injection system for large helical device <i>M. Kanno, S. Sudo, H. Yamada, O. Motojima, T. Baba</i>	1133
A repetitive pellet injector with screw extruder <i>I.V. Viniar, S.V. Skoblikov, P.Yu. Koblents, B.V. Kuteev, A.Ya. Lukin</i>	1137
A tritium compatible pneumatic pellet injector <i>P. Koblents, I. Viniar, B. Kuteev, S. Skoblikov, A. Shlyahenko, M. Parshin, G. Saksagansky, V. Skripunov, S. Saksagansky</i>	1141
A repetitive pipe-gun pellet injector <i>I.V. Viniar, S. Sudo, B.V. Kuteev, A.P. Umov, V.G. Kapralov, S.V. Skoblikov, P.Yu. Koblents, S.M. Egorov, K.V. Khlopenkov, V.V. Arhipov</i>	1145
Pellet injector with the liner compression of propellant gas <i>V.P. Bazilevski, Yu.A. Kareev, A.I. Kolchenko, V.P. Novikov</i>	1149
Pellet injector development at ORNL <i>S.K. Combs, S.L. Milora, L.R. Baylor, P.W. Fisher, C.A. Foster, C.R. Foust, M.J. Gouge, T.C. Jernigan, H. Nakamura, B.J. Denny, R.S. Willms, A. Frattolillo, S. Migliori</i>	1153
Plasma driven superpermeation and its possible fusion applications <i>M. Bacal, F. El Balghiti-Sube, A.I. Livshits, M.E. Notkin, M.N. Soloviev</i>	1157
Progress report of a cryomechanical vacuum pump prototype <i>J.P. Périm, D. Henry, R. Vallcorba, J.J. Cordier, F. Samaille</i>	1161
Development of cryopanel fast regeneration methods for use in the ITER primary vacuum system <i>C. Day, H. Hass, A. Mack</i>	1165
Primary vacuum pump concept, component testing and model pump development for ITER <i>A. Mack, J.C. Boissin, D.K. Murdoch, D. Röhrig, G. Saksagansky</i>	1169
The design of the ITER primary pumping system <i>P. Ladd, H. Hurzlmeier, G. Janeschitz, R. Marrs, K. Schaubel</i>	1173
Plasma impurity processing with HITEX <i>L. Rodrigo, J.M. Miller, J. Senohrabek</i>	1177
Tritium extraction from the coolant of a DEMO solid breeder blanket and from the coolant of an ITER blanket test module <i>H. Albrecht, E. Hutter</i>	1181
Separation of tritiated hydrogen species in the TLK isotope separation system <i>G. Neffe, J. Dehne, E. Hutter, H. Kissel, H. Brunnader</i>	1185

AMOR facility: regeneration of molecular sieve beds used for the retention of tritium at the Tritium Laboratory Karlsruhe <i>E. Hutter, H.-D. Adami, U. Besserer, R.-D. Penzhorn</i>	1189
Tritium tests with a PERMCAT reactor for isotopic swamping <i>M. Glugla, J. Miller, P. Herrmann, M. Iseli, R.-D. Penzhorn</i>	1193
Results from tritium operation of the clean-up facility CAPRICE <i>M. Glugla, R. Kraemer, T.L. Le, K.H. Simon, K. Günther, J. Wendel, R.-D. Penzhorn</i>	1197
Low tritium retention zeolites for fusion gas processing <i>F. Toci, C. Malara, T. Mencarelli, I. Ricapito</i>	1201
Experimental confirmation of the theoretical previsions for the applicability of catalytic membrane reactors for the fusion fuel cycle <i>V. Violante, S. Tosti, A. Colombini, S. Castelli, M. De Francesco</i>	1205
Tritium recovery system in helium-cooled ceramic blanket for DEMO <i>S. Tosti, A. Colombini, V. Violante, C. Rizzello</i>	1209
An alternative approach to tritium recovery from water-cooled Pb-17Li DEMO blanket <i>H. Dworschak, C. Malara, I. Ricapito, D. Sarigiannis</i>	1213
Testing of a water vapour cold trap for atmospheric air detritiation <i>C. Housiadas, K.H. Schrader</i>	1217
Development of a fusion fuel processing system at the Japan Atomic Energy Research Institute <i>S. Konishi, M. Enoeda, T. Yamanishi, K. Okuno</i>	1221
Breakthrough properties of hydrogen with Zr ₉ Ni ₁₁ particle packed bed <i>K. Tsuchiya, H. Imaizumi, H. Kawamura, T. Kabutomori, Y. Wakisaka, T. Niiho</i>	1225
Tritium recovery from Li17-Pb83 liquid breeder by permeation window method <i>T. Terai, A. Suzuki, S. Tanaka</i>	1229
Experimental closed loop for dynamic modeling of ITER vacuum-tritium system. Main parameters and status of the development <i>G.L. Saksagansky, A.I. Vedeneev, V.G. Klevtsov, E.L. Koira, V.N. Lobanov, S.A. Pimanikhin, B.N. Tenyaev, Yu.P. Averin</i>	1233
Effects of tritium and Helium-3 on life time properties of Pd-Ag alloys in ITER tritium purification technology <i>V. Tebus, G. Arutunova, V. Bulkin, E. Dmitrievsky, V. Filin, Y. Golikov, L. Panteleev, A. Perevezentsev, L. Rivkis</i>	1237

The mechanism of self radiolysis of tritiated water on molecular sieve: gas phase hydrogen isotopic distribution <i>R.T. Walters</i>	1241
Evaluation of the tritium surface activity monitor <i>W.T. Shmayda, N.P. Kherani, D. Stodilka</i>	1245
Tritium accountancy in 200 litres drums by calorimetry <i>D. Devillard, J.-P. Corot, J.Y. Floricourt</i>	1249
Analysis of hydrogen isotopes by RAMAN spectroscopy and optical fibres <i>Y. Chaufour, D. Devillard, K. Danger, D. Dall'ava, H. Berger</i>	1253
Accountancy penalty in case of hidden inventories <i>R. Avenhaus, G. Spannagel</i>	1257
Tritium experience at the Tritium Laboratory Karlsruhe <i>U. Besserer, J. Dehne, L. Doerr, M. Glugla, W. Hellriegel, T. Le, F. Schmitt, K.H. Simon, T. Vollmer, J. Wendel, R.-D. Penzhorn</i>	1261
Tritium monitoring by gas scintillation <i>P. Pacenti, F. Campi, C. Mascherpa, S. Terrani</i>	1265
Hot commissioning of the analytical glovebox system in ETHEL <i>U. Engelmann, G. Vassallo</i>	1269
A solid scintillator area monitor for tritiated water vapor in air <i>F. Campi, R.A.H. Edwards, A. Ossiri, P. Pacenti, S. Terrani</i>	1273
Tritium technology research and development at the tritium process laboratory of JAERI <i>K. Okuno, S. Konishi, T. Yamanishi, S. O'Hira, M. Enoda, T. Hayashi, H. Nakamura, Y. Kawamura, Y. Iwai, K. Kobayashi</i>	1277
Radiogenic helium thermodesorption from uranium deuterotritide <i>P.G. Berezhko, A.I. Vedeneev, B.F. Dadonov, V.P. Sorokin</i>	1281
Specialized mass spectrometers for analysis tritium gas mixes in "on-line" mode in technological systems of TR <i>I. Milechkine, N. Aryev, L. Gall, B. Mamyrin, N. Riazantseva, G. Saksagansky</i>	1285
Testing of the cryogenic target handling system for the OMEGA laser <i>D.T. Goodin, N.B. Alexander, W.A. Baugh, C.T. Beal, G.E. Besenbruch, K.K. Boline, L.C. Brown, W. Egli, J.F. Follin, C.R. Gibson, M.J. Hansink, E.H. Hoffmann, W. Lee, R.A. Mangano, K.R. Schultz, R. Stemke, T.A. Torres</i>	1289

Section G: Blanket Technology/Materials

DEMO blanket segment fabrication using advanced HIP technology <i>C. Dellis, G. Chaumat, M. Fütterer, L. Giancarli, G. Le Marois</i>	1295
Development and design of water-cooled ceramic breeding blanket for ITER <i>Y. Poitevin, R. Antidormi, B. Bielak, L. Giancarli</i>	1299
Design and transient thermal analysis of a water-cooled Pb-17Li test blanket for ITER <i>M.A. Fütterer, B. Bielak, J.-P. Deffain, L. Giancarli, N.B. Morley, J-F. Salavy, J. Szczechanski</i>	1303
EU water-cooled Pb-17Li DEMO blanket: fabrication issues and future R&D priorities <i>L. Giancarli, G. Benamati, M.A. Fütterer, C. Nardi, J. Reimann, K. Schleisiek</i>	1307
Solid HIPed demonstrator of ITER blanket — shield modules <i>M. Febvre, J.L. Deneuville, P. Lorenzetto, W. Daenner</i>	1311
Design and analysis of the ITER breeding blanket <i>Y. Gohar, M. Billone, A. Cardella, I. Danilov, W. Dänner, M. Ferrari, M. Giegerich, K. Ioki, T. Kuroda, D. Lousteau, P. Lorenzetto, S. Majumdar, R. Mattas, K. Mohri, R. Parker, R. Raffray, Y. Strebkov, H. Takatsu, E. Zolti</i>	1315
HEBLO, a helium blanket test loop for small test sections of helium cooled solid breeder blankets <i>P. Norajitra, D. Piel, G. Reimann, R. Ruprecht</i>	1319
Development of fabrication techniques for the European helium cooled pebble bed breeder blanket <i>T. Heider, G. Reimann, H. Riesch-Oppermann, K. Schleisiek</i>	1323
The ITER “L-4” blanket project <i>W. Dänner, A. Cardella, K. Ioki, R. Mattas, Y. Strebkov, H. Takatsu</i>	1327
ITER blanket system design <i>K. Ioki, L. Bruno, A. Cardella, W. Dänner, A. Lodato, D. Lousteau, R. Mattas, K. Mohri, R. Parker, R. Raffray, Y. Strebkov, N. Tachikawa, H. Takatsu, D. Williamson, M. Yamada</i>	1331
He-FUS 3 — European helium cooled blanket test facility for DEMO <i>G. Dell'Orco, G.C. Bertacci, M. Mazza, L. Borsati, F. Mariotti, R. Penco, P.L. Valente</i>	1335
Design development of breeding blanket based on pebble bed concept for fusion experimental reactor <i>H. Miura, K. Kitamura, H. Takatsu, T. Kuroda, T. Kurasawa, S. Sato, K. Furuya, T. Hatano, I. Tokami, Y. Itou, T. Osaki, T. Hashimoto, S. Sato, I. Kawaguchi</i>	1339

Fabrication of small-scaled shielding blanket module and first wall panel for international thermonuclear experimental reactor <i>K. Furuya, S. Sato, T. Kuroda, T. Kurasawa, I. Tokami, T. Hatano, H. Miura, H. Takatsu</i>	1343
Development of full-scale sector model for ITER vacuum vessel <i>K. Koizumi, M. Nakahira, Y. Itou, N. Kanamori, K. Kitamura, E. Tada, G. Jonhson, K. Shimizu, G. Sannazzaro, K. Takahashi, Y. Utin, K. Ioki</i>	1347
Design study of in-pile blanket mockup simulated neutron pulse operation of fusion reactor <i>M. Nakamichi, H. Sagawa, K. Yamaguchi, T. Ishitsuka, H. Kawamura</i>	1351
Computer simulations of displacement damage in solid breeder blankets <i>D. Leichtle</i>	1355
High temperature cyclic stress-strain response of structural stainless steels for thermonuclear fusion reactors <i>A.F. Armas, I. Alvarez-Armas, M. Avalos, C. Peterson, R. Schmitt</i>	1359
Mechanical properties of the martensitic chromium steel F82H Mod., heat 9741 <i>L. Schäfer, M. Schirra, R. Lindau</i>	1363
Mechanical properties of the MANET-II martensitic chromium steel and their optimization <i>L. Schäfer</i>	1367
Buckling analysis of the W7-X inner vacuum vessel <i>J. Simon-Weidner, N. Jaksic, J. Sapper</i>	1371
Joining of SiC/SiC composites using a SiOC glass <i>A. Donato, P. Colombo, Th. Dikonimos Makris, R. Giorgi, M.O. Abdirashid, G. Scarinci</i>	1375
SiC/SiC fiber ceramic matrix composites for fusion application: a new manufacturing process <i>A. Donato, C.A. Nannetti, A. Ortona, S. Botti, G. D'Alessandro, G. Filacchioni, A. Masci</i>	1379
Low cycle fatigue and electrochemical behaviour of F82H martensitic steel in water coolant environments <i>M.F. Maday</i>	1383
Mechanical and structural properties of Ti-bearing reduced activation martensitic steels <i>G. Filacchioni, L. Pilloni, F. Attura, E. Casagrande, U. De Angelis, G. De Santis, D. Ferrara</i>	1387
Thermomechanical behaviour of SiC/SiC composites in helium environments <i>A.J.F. Rebelo, M. Oksanen, P. Fenici, H. Kolbe</i>	1391

Post-irradiation mechanical properties of low-activation Cr-Mn austenitic steels <i>R.A.H. Edwards, G.P. Tartaglia, P. Bottelier, P. Fenici</i>	1395
Effect of neutron irradiation on mechanical properties of Nb-1%Zr/SS304 joints fabricated by friction welding <i>K. Tsuchiya, H. Kawamura, T. Niiho</i>	1399
Structural analysis of blanket system and vacuum vessel for International Thermonuclear Experimental Reactor (ITER) <i>K. Kitamura, K. Koizumi, H. Takatsu, Y. Itou, M. Nakahira, E. Tada, T. Tsunematsu</i>	1403
Density improvement of Li ₂ O pebble fabricated by sol-gel method <i>K. Tsuchiya, H. Kawamura, K. Fuchinoue, S. Yoshimuta, K. Watarumi, T. Niiho</i>	1407
Model for steady-state tritium analysis in ceramic breeder blanket. Comparsion of inventory results with mistral code predictions <i>R. Antidormi, N. Roux</i>	1411
Understanding of experimental results on the radiation enhancement of H-Isotopes' permeability through austenitic/martensitic steels <i>L.A. Sedano, A. Perujo, B.G. Polosukhin, N.G. Primakov, I.L. Tazhibaeva</i>	1415
Elaboration of alumino-forming coatings for tritium permeation barriers using "low" temperature CVD <i>F. Schuster, C. Chabrol, E. Blanquet, C. Bernard, F. Maury, F. Felten, A. Terlain</i>	1419
The formation of aluminide coatings on MANET stainless steel as tritium permeation barrier by using a new test facility <i>H. Glasbrenner, J. Konys, G. Reimann, K. Stein, O. Wedemeyer</i>	1423
Tritium control in the European helium cooled pebble bed blanket <i>L. Berardinucci, M. Dalle Donne</i>	1427
Tritium release from neutron irradiated beryllium pebbles <i>F. Scaffidi-Argentina, H. Werle</i>	1431
Effect of alloying elements on mechanical and microstructural characteristics of aluminide coatings on MANET steel <i>G. Benamati, H. Glasbrenner, A. Casagrande, C. Fazio</i>	1435
TiCN and surface oxidation as hydrogen permeation barrier in F82H: a comparison <i>E. Serra, A. Perujo, G. Benamati</i>	1439
The effect of cyclic loads on the hydrogen permeation rate of structural materials <i>T. Sample, H. Kolbe, A. Perujo, P. Fenici</i>	1443
Deuterium permeation through TiN and TiN-TiC coatings deposited on F82H steel <i>A. Sabbioni, N. Laidani, A. Miotello, G. Benamati</i>	1447

Mechanism of defects production in Li_2O and their influence on tritium release <i>V. Grishmanov, S. Tanaka, J. Tiliks</i>	1451
Tritium release from Li_2O single crystals irradiated with fast neutrons <i>T. Tanifugi, D. Yamaki, K. Noda, O.D. Slagle, F.D. Hobbs, G.W. Hollenberg</i>	1455
In-situ tritium release behaviour from molten Li_2BeF_4 salt under neutron irradiation <i>A. Suzuki, T. Terai, S. Tanaka</i>	1459
Tritium distribution and release from neutron irradiated lithium orthosilicate pebbles <i>A. Abramenkovs, J. Tiliks, G. Kizane, H. Werle, S. Tanaka</i>	1463
Neutron irradiated beryllium: fracture toughness <i>F. Moons, J.L. Puzzolante, A. Rahn, J. Van de Velde</i>	1467
On the use of zirconate/titanate for the helium-cooled ceramic pebble-bed DEMO blanket <i>M. Eid, R. Antidormi, B. Bielak, L. Giancarli, V. Mathis, N. Roux, J.-F. Salavy, J. Szczepanski</i>	1471
Replenishment of lithium lost from Pb-17Li: an assessment of the methods available for addition of lithium to Pb-Li alloys <i>P. Hubberstey, M.J. Capaldi, F. Barbier</i>	1475
Behavior of bismuth in lithium-lead mixtures <i>S. Bucké, H. Feuerstein, L. Hörner, J. Beyer, S. Horn</i>	1479
Development work for lithium orthosilicate pebbles <i>M. Dalle Donne, G. Piazza, A. Weisenburger, H. Werle, V. Geiler, B. Speit, D. Sprenger</i>	1483
Metallographic investigation and mechanical behavior of beryllium pebbles at room temperature <i>M. Dalle Donne, E. Kaiser, O. Romer, F. Scaffidi-Argentina, P. Weimaar, H. Werle</i>	1487
Effect of neutron irradiation swelling on the heat transfer behavior of a beryllium pebble bed <i>F. Scaffidi-Argentina</i>	1491
Studies on surface hydroxyl group on Li_2O by infrared absorption and ab-initio calculation and their consequence on tritium desorption <i>M. Taniguchi, S. Tanaka</i>	1495
Reprocessing technology development for irradiated beryllium <i>H. Kawamura, K. Tatenuma, Y. Hasegawa, N. Sakamoto, K. Nishida</i>	1499
Thermal properties of neutron irradiated beryllium <i>E. Ishitsuka, H. Kawamura, T. Terai, S. Tanaka</i>	1503

The influence of magnetic field on the radiolysis of lithium orthosilicate ceramics <i>J. Tiliks, S. Tanaka, G. Kizane, A. Supe, A. Abramenchovs, V. Grishmanov</i>	1507
Performance of ceramic breeder materials irradiated to high lithium burnups in exotic-7 <i>J.G. van der Laan, M. Stijkel, R. Conrad</i>	1511
Heat transfer and secondary motion in liquid metal flow in horizontal duct under fusion relevant conditions <i>V.G. Sviridov, N.G. Razuvanov, A.V. Ustinov, Yu.S. Shpanskij</i>	1515
Effect of the presence of ferromagnetic structural material on the DEMO helium cooled pebble bed blanket during plasma disruptions <i>L.V. Boccaccini, P. Ruatto</i>	1519
Application of a mesh refining procedure to the electromagnetic analysis of the DEMO HCPB blanket concept during disruptions <i>L.V. Boccaccini, B. Tellini</i>	1523
MHD issues of the European self-cooled and water-cooled 83 Pb-17Li blankets <i>J. Reimann, G. Benamati, R. Moreau</i>	1527
MHD turbulence generation in bends perpendicular to the magnetic field <i>J. Reimann, S. Dementjev, A. Flerov, I. Platnieks</i>	1531
Compatibility of insulating ceramic materials with molten lithium metal <i>T. Yoneoka, T. Mituyama, T. Terai, S. Tanaka</i>	1535
Safety assessment and accident management of a water-cooled Pb-17Li test blanket for ITER <i>Y. Severi, C. Bertrand, M.A. Fütterer, L. Giancarli, G. Marbach, N.B. Morley</i>	1539
Analysis of loss of flow transients in the first wall cooling system of the water-cooled Pb-17Li blanket concept for the European DEMO fusion reactor <i>K. Gabel, K. Kleefeldt</i>	1543
Reliability & availability analysis as a decisional means at early stages of the new machines design <i>C. Nardi, H. Schnauder, M. Eid</i>	1547
Effects of water micro-leaks in a Pb-17Li DEMO blanket module <i>L. Rapezzi, M. Guccini, G. Benamati</i>	1551
Neutron flux experiment in the ITER shield mock-up at FNG <i>A. Santamarina, L. Benmansour, B. Camous, H. Philibert, P. Batistoni, M. Pillon</i>	1555
Three-dimensional activation analysis for DEMO type fusion reactor blankets <i>H. Tsige-Tamirat</i>	1559

Three-dimensional neutronics analyses of the ITER bulk shield experiment <i>U. Fischer, P. Batistoni, M. Pillon</i>	1563
Methods for nuclear heating measurements in an ITER shield-blanket mock-up <i>H. Freiesleben, W. Hansen, K. Merla, D. Richter, K. Seidel, S. Unholzer</i>	1567
Measurement and analysis of spectral neutron and photon fluxes in an ITER shield mock-up <i>H. Freiesleben, W. Hansen, D. Richter, K. Seidel, S. Unholzer, U. Fischer, Y. Wu, M. Angelone, P. Batistone, M. Pillon</i>	1571
A 14-MeV neutron transmission experiment on vanadium <i>U. von Möllendorff, B.V. Devkin, U. Fischer, B.I. Fursov, M.G. Kobozev, M.M. Potapenko, S.P. Simakov, V.A. Talalaev, Y. Wu</i>	1575
ITER nuclear analysis <i>R.T. Santoro, H. Iida, V. Khripunov, S. Mori, L. Petrizzi, D. Valenza and members of the European Union, Japan, Russian Federation and U.S. Home Teams</i>	1579
Nuclear analysis of an ITER inboard blanket module <i>G. Vella, O. Fiorella, D. Valenza, R.T. Santoro</i>	1583
2-D overall shielding analysis of ITER tokamak machine <i>S. Sato, H. Takatsu, K. Maki, T. Utsumi, H. Iida, R.T. Santoro</i>	1587
Characterization of self-powered neutron detector at high temperature under neutron irradiation <i>M. Nakamichi, C. Yamamura, H. Sagawa, N. Nakazawa, H. Kawamura</i>	1591
Evaluation and test of high energy neutron cross-section data for the IFMIF intense neutron source <i>Yu.A. Korovin, A.Yu. Konobeyev, V.P. Lunev, P.E. Pereslavtsev, A.Yu. Stankovsky, U. Fischer, U.v. Möllendorff, M. Soksic-Kostic, P. Wilson, D. Woll</i>	1595
Analysis and implementation of a Monte Carlo high energy neutrons source for IFMIF <i>P.P.H. Wilson, U. Fisher</i>	1599
Fusion materials activation tests with a deuterium-beryllium neutron source <i>U. von Möllendorff, H. Giese, H. Tsige-Tamirat</i>	1603
Applicability of the FIMEC indentation test to characterize materials irradiated in the future IFMIF high intensity neutron irradiation source <i>P. Gondi, R. Montanari, A. Sili, S. Floglietta, A. Donato, G. Filacchioni</i>	1607
The HRF Petten as a test bed for breeder materials and blanket concepts for ITER and DEMO <i>R. Conrad, J. van der Laan</i>	1611

Toward an international fusion materials irradiation facility
F. Cozzani, T. Kondo, T. Shannon, F.W. Wiffen, L. Zavialsky

1615

Section H: Assembly, Remote Handling and Waste Management and Storage

Measuring sound and vibrations under high radiation for enhanced safety in fusion reactor remote handling

S. Coenen, M. Decréton, I. Baetens

1621

Motors for the in-vessel handling unit — a radiation hardening achieved up to 80 MGy

M. Decréton, B. Haferkamp, M. Englert, A. Rahn, A. Suppan

1625

Water hydraulics in ITER divertor refurbishment

M. Siuko, M.J. Vilenius, T. Vivarlo, K.T. Koskinen, E. Mäkinen, E. Luodemaki, A. Timperi

1629

Design of the ITER divertor remote handling system

E. Martin, T. Burgess, G. Cerdan, C. Damiani, D. Duglué, G. Janeschitz, D. Maisonnier, K. Shibanuma, M. Sironi, E. Tada, A. Tesini, R. Tivey

1633

International Thermonuclear Experimental Reactor in-vessel viewing system ITER/IVVS

A. Timperi, D. Maisonnier, E.R. Hager, T. Businaro, L. Consano, H. Hannula, S. Kuitunen, V.-P. Lappalainen, M. Lopez, P. Stigell, T. Ylikorpi, M. Aikio, H. Ailisto, V. Heikkinen, M. Lindholm, A. Halme, P. Jakubik, J. Suomela, J. Heimsch, I. Bhandal

1637

ITER divertor PFC's attachment and replacement

A. Antipenkov, S. Chiocchio, D. Dilling, G. Janeschitz, D. Maisonnier, E. Martin, S. Schleicher, R. Tivey, A. Turner

1641

Development of a NiTi shape memory alloy vacuum tight flange for JET in-vessel inspection system

S. Besseghini, T. Businaro, S. Ceresara, A. Tuissi

1645

Blanket cooling pipe maintenance system for fusion experimental reactor

K. Oka, S. Kakudate, M. Nakahira, K. Taguchi, A. Itoh, E. Tada, A. Tesini, K. Shibanuma, R. Haange

1649

Development of an end-effector for ITER blanket module handling

M. Nakahira, K. Oka, S. Kakudate, S. Fukatsu, K. Taguchi, E. Tada, K. Shibanuma, N. Matsuhira, R. Haange

1653

Development of locking and mover system for ITER divertor maintenance

S. Fukatsu, N. Takeda, S. Kakudate, E. Martin, T. Burgess, K. Shibanuma, D. Maisonnier, E. Tada

1657

Remote operations for the repair and replacement of a poloidal field coil in ITER

A. Tesini, D. Dilling, R. Bourque, Y. Nakashima, Z. Piec, M.E.P. Wykes, K. Yoshida, D. Maisonnier, C. Pascual, I. Ibarreche, J. Icaran, A. Mousdell, E. Barratt, J. Gilroy, E. Tada, F. Kimball, F. Vivaldi

1661

Radiation effects on remote handling system components <i>R.E. Sharp, S.L. Pater</i>	1665
The command and control system for JET remote handling equipment <i>L. Galbiati, P. Carter, B. Haist</i>	1669
The implementation and operation of a full size mock-up facility in preparation for remote handling of JET divertor modules <i>R. Cusack, P. Brown, B. Haist, A. Loving, R. Stokes</i>	1673
Design and development of a new remote handling transporter facility for JET <i>L.P.D.F. Jones, M. Irving, J. Palmer, D. Hamilton</i>	1677
Design and development of remote handling tools for the JET divertor exchange <i>S.F. Mills, A.B. Loving</i>	1681
The assessment and improvement of JET remote handling equipment availability <i>A.C. Rolfe, E. Scott, D. Smith</i>	1685
Tokamak component handling, maintenance and associated service building <i>D.M. Banks, G. Janeschitz, D. Dilling, M. Pascual</i>	1689
Steel reprocessing strategy for fusion reactor dismanteling <i>G. Marbach, L. Boisset, P. Giroux</i>	1693
French experience in steel detritiation <i>L. Boisset, C. Lattaud, P. Giroux</i>	1697
ITER waste management strategies and final disposal <i>S. Nisan, K. Brodén, M. Lindberg</i>	1701
Detritiation of graphite and beryllium plasma-facing components <i>P. Pacenti, R.A.H. Edwards, F. Campi</i>	1705
The divertor test platform <i>C. Damiani, D. Cassarini, P.A. Gaggini, P. Scarella, M. Tarantini, G. Fermani, G. Cerdan, D. Maisonnier, J. Sheppard, J. Millard, J. Blevins, E. Martin, D. Duglué, A. Tesini, E. Tada</i>	1709

Section I: Safety and Environment, Reactor Studies

Divertor cooling system simulation with the ATHENA code <i>W. Van Hove, E. Komen, L. Bartsoen, E. Stubbe</i>	1715
Tritium chronic release estimates for the ITER design <i>K.M. Kalyanam, A. Natalizio</i>	1719

Dose monitoring and control at a radioluminescent light manufacturer <i>W.T. Shmayda, A.B. Antoniazzi, P. Hirst, E. Ketyle</i>	1723
Hydrogen hazard in a fusion reactor: evaluation and mitigation <i>V. Chaudron, L. Boisset, A. Laurent, F. Arnould, C. Latge</i>	1727
Multiple failure sequence in the divertor cooling loop of SEAFP-calculation of an ex-vessel LOCA and the induced in-vessel LOCA using the CATHARE code <i>P. Sardain, G. Franzoni</i>	1731
An application of the lines of defence (LOD) method in the studies on the fusion reactor safety <i>G.L. Fiorini, G. Franzoni</i>	1735
Effect of PFCs evaporation on plasma shutdown during a loss of flow accident scenario <i>G. Franzoni, P. Sardain, J. Villar Colomé</i>	1739
Modeling of thermal hydraulic phenomena for high flux components in fusion reactors during accidental conditions <i>G. Langlais, C. Girard, G. Marbach</i>	1743
Safety and dependability for experimental fusion reactor design <i>D. Soussan, M. Bernard</i>	1747
Tritium sorption in carbon dust <i>D. Boyer, Ph. Cétier, L. Dupin, Y. Belot, C.H. Wu</i>	1751
Analysis of ITER accident sequences <i>W. Gulden, H.-W. Bartels, D. Holland, B. Kolbasov, D. Petti, S. Piet, A. Poucet, J. Raeder, Y. Seki</i>	1755
Development of an integrated system of codes for ITER safety analysis, ISAS <i>S. Nisan, I. Toumi, M-T. Porfiri, T. Boubée de Gramont</i>	1759
Evaluation of the activated corrosion product source term for ITER heat transfer systems <i>S. Nisan, L. Di Pace, J.-C. Robin</i>	1763
Safety assessment of two DEMO blanket concepts: Helium-cooled pebble bed vs. dual coolant <i>K. Kleefeldt, K. Gabel</i>	1767
Comparison of site specific probabilistic dose assessments with deterministic generic dose values compiled within the ITER-EDA <i>W. Raskob, O. Edlund</i>	1771
Reponse of ITER divertor to loss of coolant and loss of flow accidents <i>J.-M. Gay, G. Marbach, E. Ebert</i>	1775

Multiple failure accident sequences for SEAPP reactor <i>R. Caporali, T. Pinna, M.T. Porfiri</i>	1779
Evaluation of the environment source terms for ITER divertor primary heat transfer system LOCAS <i>G. Cambi, M.T. Porfiri, D.G. Cepraga</i>	1783
Envelope analysis of post-accidental thermal transients for ITER <i>F. Andritsos, D.A. Sarigiannis, L. Daverio</i>	1787
In-vessel dust removal system using static electricity <i>I. Aoki, Y. Seki, S. Ueda, R. Kurihara, M. Onozuka, Y. Ueda, Y. Oda</i>	1791
Accidental overpressure suppression for the ITER vacuum vessel <i>M. Wykes, Y. Nakashima, L. Topilski, S. Piet, D. Holland, Y. Seki, F. Kasahara, M. Yamauchi</i>	1795
Design analysis for reducing dose rate in the NBI to realize direct access by workers for a fusion experimental reactor <i>K. Shibata, T. Inoue, K. Maki, Y. Yamashita</i>	1799
Tritium containment in the dust and debris of plasma-facing materials produced during operations <i>I. Konkashbaev, A. Hassanein, Ju. Grebenishikov</i>	1803
Analysis of possible accidents in ITER cryostat <i>B.N. Kolbasov, D.K. Kurbatov, D.P. Ivanov, A.Yu. Pashkov</i>	1807
Tritium permeation through 04X16H11M3T steel in the presence of Li ₁₇ Pb ₈₃ molten alloy <i>V. Tebus, V. Demidov, A. Zyrionov, V. Zakhartsev</i>	1811
Influence of some structural factors on hydrogen penetration through structural materials during hydrogen ion bombardment <i>A.G. Zaluzhnyi, V.P. Kopytin, M.V. Tcherednichenko-Alchevskiy</i>	1815
Evaluation of second confinement concepts for water-cooled and helium-cooled fusion reactors <i>R. Blomquist, J. Collén, E. Ebert, A. Natalizio, K. Shen, S.K. Sood</i>	1819
Activation product transport modelling for the liquid metal loop of a fusion power plant using the code TRAP <i>P.J. Karditsas, C.B.A. Forty</i>	1823
Monodisperse aerosol modelling for fusion power plant containments and comparison with polydisperse calculations <i>W.E. Han</i>	1827

Safety and environment assessment of a variety of blanket concepts and structural materials <i>N.P. Taylor, C.B.A. Forty, W.E. Han, I. Cook, C. Clair</i>	1831
Preliminary cooling circuit activation and ORE assessment for ITER <i>C.B.A. Forty, P.J. Karditsas</i>	1835
ITER seismic analysis and structural design <i>P. Barabaschi, V. Chuyanov, D. Dilling, G. Jonhson, R. Gallix, S. Sadakov, G. Sannazzaro, C. Sborchia</i>	1839
Dose due to mobilization of tungsten activation products in air <i>K.A. McCarthy, G.R. Smolik, D.L. Hagrman, K. Coates</i>	1843
Designing a maintainable tokamak power plant <i>L.M. Waganer, F.R. Cole and the ARIES team</i>	1847
ITER plasma safety interface models and assessments <i>N.A. Uckan, H.-W. Bartels, T. Honda, S. Putvinski, T. Amano, D. Boucher, D. Post, J. Wesley</i>	1851
Engineering overview of Aries-RS tokamak power plant <i>M.S. Tillack and the ARIES team</i>	1855
Engineering design of DREAM components <i>I. Kawaguchi, J. Adachi, S. Yamazaki, S. Ueda, S. Nishio, Y. Seki, R. Kurihara, I. Aoki, T. Kunugi, T. Kuroda, H. Miura</i>	1859
Blanket energy multiplication factor influence on maximum commercial inertial fusion power plant construction cost <i>N. Cerullo, S. Lanza, M. Vezzani</i>	1863
Design of tokamak reactors: a heuristic approach <i>J.-M. Ané, S. Brémond, X. Garbet, J. Johner, C. Leloup, P. Magaud, M. Pain, B. Pégourié, G. Tonon, B. Turck, J. Villar Colomé, J.G. Wegrove, J. Weisse</i>	1867
Operator protection for a future commercial fusion plant <i>J. Mustoe, S.M. Ali, L. Di Pace, C.B.A. Forty, B.-C. Friedrich, S. Sandri, H.M. Thompson</i>	1871
Author index	A1