

Contribution ID: 148

Type: Poster

EX/P5-09: Overview of the International Research on Ion Cyclotron Wall Conditioning

Thursday, 11 October 2012 08:30 (4 hours)

This paper gives an overview of the experimental and modeling activity on Ion Cyclotron Wall Conditioning (ICWC), which is currently coordinated by the ITPA Scrape-Off-Layer & Divertor Topical Group, in order to assess the applicability of this technique for ITER for recovery from disruptions, vent or air leak, recycling control and mitigation of the tritium inventory build-up. Experimental results obtained on TORE SUPRA, TEXTOR, ASDEX-Upgrade, JET, KSTAR and LHD are presented. The conditions for safely producing RF plasmas with conventional ICRH antennas have been carefully investigated. Discharge homogeneity has been improved by adding a small poloidal component to the toroidal field. The use of pulsed discharges allows mitigating re-implantation of wall desorbed particles reionized in the ICWC discharge. A 0-D model of ICWC plasmas in He and H2 has been developed which reproduces wall density, neutral and ion fluxes determined experimentally. Experimental observations in carbon devices and modelling seem to indicate that ICWC plasmas interact preferentially with transient reservoirs in carbon rather than in co-deposited layers. The found fuel removal rates are extrapolated to ITER, but it is pointed that efficiency with decrease with ICWC operation time.

Country or International Organization of Primary Author

CEA, IRFM

Collaboration (if applicable, e.g., International Tokamak Physics Activities)

ITPA Scrape-Off-Layer & Divertor Topical Group

Primary author: Mr DOUAI, David (France)

Co-authors: Dr LYSSOIVAN, Anatoli (ERM/Laboratory for Plasma Physics, Belgium); Dr KRETER, Arkadi (IEK-4 (Plasmaphysik) FZ Jülich, Euratom Association, 52425 Jülich, Germany, TEC partner); Dr PÉGOURIÉ, Bernard (CEA, IRFM, F-13108 St-Paul-Lez-Durance, France); Dr SERGIENKO, Gennady (IEK-4 (Plasmaphysik) FZ Jülich, Euratom Association, 52425 Jülich, Germany, TEC partner); Mr LOMBARD, Gilles (CEA, IRFM, F-13108 St-Paul-Lez-Durance, France); Dr NOTERDAEME, Jean-Marie (Gent University, EESA Department, B-9000 Gent, Belgium); Dr ONGENA, Josef (LP-P-ERM/KMS, Association Euratom-Belgian State, 1000 Brussels, Belgium, TEC partner); Mrs GRAHAM, Margaret (CCFE, Culham Science Centre, OX14 3DB, Abingdon, UK); Dr MAYORAL, Marie-Line (CCFE, Culham Science Centre, OX14 3DB, Abingdon, UK); Dr SHIMADA, Michiya (ITER Organization, Route de Vinon sur Verdon, 13115 St. Paul lez Durance, France); Dr BREZINSEK, Sebastijan (IEK-4 (Plasmaphysik) FZ Jülich, Euratom Association, 52425 Jülich, Germany, TEC partner); Dr HONG, Suk-Ho (National Fusion Research Institute, Korea); Dr KIM, Sun-Ho (Korea Atomic Energy Research Institute,

Daedeok-Daero 989-111, Yuseong-Gu, Daejon, Korea); Dr WANG, Sun-Jung (Korea Atomic Energy Research Institute, Daedeok-Daero 989-111, Yuseong-Gu, Daejon, Korea); Dr BRÉMOND, Sylvain (CEA, IRFM, F-13108 St-Paul-Lez-Durance, France); Dr WAUTERS, Tom (ERM/Laboratory for Plasma Physics, Belgium); Dr PHILLIPS, Volker (FZJ/ Institut für Energieforschung - Plasmaphysik (IEF-4), Germany); Dr ROHDE, Volker (Max-Planck-Institut für Plasmaphysik, Germany); Dr BOBKOV, Volodymyr (Max-Planck Institut für Plasmaphysik, Euratom Association, 85748 Garching, Germany)

Presenter: Mr DOUAI, David (France)

Session Classification: Poster: P5

Track Classification: EXD - Magnetic Confinement Experiments: Plasma–material interactions; divertors; limiters; scrape-off layer (SOL)