- Curriculum Vitae -

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Biography

1979	BS, University of Tokyo
1981	MS, University of Tokyo
1981-2003	Japan Atomic Energy Research Institute
1986, 1987	Assignment to Tritium Systems Test Assembly (TSTA), Los Alamos, USA
1989-1991	National Laboratory, USA, As Japanese Team Leader under US-Japan Collaborative Program
1991	Involved in first DT campaign at JET, United Kingdom
1991-	ITER Engineering Design Activity Team Member at JAERI
2001-2011	Editor, Fusion Engineering and Design Journal, Elsevier
2003-present	Professor, School of Energy Science, Kyoto University
2008-2012	Director, Institute of Sustainability Science, Kyoto University
2009-2012	Chair of the ITER TBM Program Committee
2012-2017	ITER Program Committee, Japanese Representative
2014-2016	Board of Director Member, Atomic Energy Society of Japan
2017-present	ITER TBM Project Steering Committee, Japanese Representative
2017-present	Board of Director, Japan Society of Plasma Science and Nuclear Fusion Research

Research activity

Tritium Processing Technology:

- Design and test of tritium processing components. This includes demonstration experience of tritium processing components with pure tritium gas (for 1-year continuous operation).
- Design of ITER fuel cycle in the CDA. Took part of ITER fuel cycle design in the EDA.
- Tested/demonstrated components, including palladium membrane diffuser for purification, Solid Oxide Electrolysis cell for tritiated water decomposition, vacuum pumps, Storage bed based on ZrCo intermetallic tritide, cryogenic distillation, thermal diffusion, CECE-tritiated water separation, ion chamber, calorimetry, gas chromatograph.
- Integrated fusion inner fuel cycle demonstration for up to 25 days continuously at the Tritium Systems Test Assembly at Los Alamos National Laboratory, US.
- Modelling and strategic planning of tritium fuel cycle without external source and start up analysis of DT fusion device from DD reaction.

Tritium and Fusion Safety (including environmental tritium behaviour)

- Design and test of tritiated water processing system based on Catalytic Exchange/Electrolysis.

- Operation and testing of tritium processing system “Tritium Process Laboratory” with 60 gram of tritium inventory. Safety systems based on gloveboxes, catalytic oxidation, dryer beds with mol-sieves.
- Safety assessment of ITER and its environmental impact analysis assuming siting in Japan.
- Fukushima clean-up operations.
- Environmental impact study of tritium released from fusion plant for 100 years.

Breeding Blanket Technology:

- Design and test of high temperature LiPb liquid metal blanket with SiC composite material and its demonstration up to 1000°C.
- Design and test of breeding components and materials: Li based ceramics, solid breeder and water-cooled blanket including irradiation tests.

Advanced Fusion Materials, including Divertor and High heat flux components:

- Material compatibility study of tritium with various metals, ceramics, organic materials and solubility/permeability measurement.
- Design of Fusion Neutron Source IFMIF.
- Energy Conversion Technologies, including high-temperature intermediate heat exchangers for fusion applications (SiCf/SiC composite).
- Divertor development study for heat transfer from 20MW/m2 heat load.
- Divertor pumping study with proton conductor pump for continuous recycling.

Fusion power plant design and energy applications, including:

- Design of Japanese DEMO plants with power conversion systems for electricity generation and hydrogen production.
- Non-electricity applications including hydrogen.
- Economic Analysis of Fusion - Fusion economy study and market deployment analysis.
- Fusion for carbon capture via biomass gasification.
- Design of low aspect ratio tokamak power plant with high temperature superconductor generating 20T.
- Compact Fusion Neutron Sources and applications.

Publications

Approximately 250 Tritium and/or Fusion related publications, 40 Patents.

Languages

Japanese (native)

English (C1 in CEFR standards)