Fifth International Workshop on Structural Material for Innovative Nuclear Systems (SMINS-5)
8-11 July 2019
Programme

Monday 8 July

Opening session
08:00 09:10 Registration
09:10 09:20 Welcome address from Kyoto University and JAEA
09:20 09:30 Welcome address from NEA/Chair of the SAC

SESSION 1: Overview of programmes
Chair: Akihiko Kimura
09:30 09:50 Overview of Japanese programmes on materials for innovative nuclear systems
Tai Asayama (JAEA, Japan)
09:50 10:10 The Joint Programme on Nuclear Materials (JPNM) of the European Energy Research Alliance and the M4F Project
Lorenzo Malerba (EERA, JPNM)

SESSION 2: Fundamental studies
Chair: Céline Cabet
10:10 10:30 On the role of Ni, Si and P on the nanostructural evolution of FeCr alloys under irradiation – link with hardening.
Cristelle Pareige (Uni. Rouen, France)

10:30 11:00 Coffee

11:00 11:20 Radiation-induced formation of minor solute clusters in ferritic/martensitic Fe-Cr alloys
Lorenzo Malerba (CIEMAT, Spain)
11:20 11:40 Primary damage in structural materials at the quantum scale
Pär Olsson (KTH, Sweden)
11:40 12:00 Experimental and theoretical investigations of effects of fast particle irradiations
Alexander Ryazanov (Kurchatov Institute, Russia)
12:00 12:20 Influence of irradiation on the hydrogen isotope permeation behaviour in the oxidised Fe-Cr-Al ferritic steel
Yuping Xu (CAS, China)
12:20 12:40 Discussion

12:40 14:10 Lunch
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14:10</td>
<td>Poster session</td>
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<tr>
<td>16:00</td>
<td>Poster presentations (30*3 mins) (allowing for change over)</td>
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<td>16:00</td>
<td>Coffee</td>
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<td>16:30</td>
<td>SESSION 3: ODS</td>
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<td>16:30</td>
<td>Chair: Yugang Wang</td>
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<td>16:30</td>
<td>Keys for radiation tolerance of ODS steels for advanced nuclear systems</td>
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<td>16:30</td>
<td>Akihiko Kimura (Kyoto Uni., Japan)</td>
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<td>16:30</td>
<td>Pressure Resistance Weld Development for ODS Cladding</td>
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<td>16:30</td>
<td>Jian Gan (INL, US)</td>
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<td>Mechanical properties, welding performance and high temperature steam</td>
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<td>oxidation resistance of the fuel cladding fabricated using cast CNS-I-ODS</td>
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<td>Qingzhi Yan (Uni. Beijing, China)</td>
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<td>17:30</td>
<td>Discussion</td>
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<td>17:30</td>
<td>Tuesday 9 July</td>
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<tr>
<td>08:30</td>
<td>SESSION 1: Overview of programmes</td>
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<td>08:30</td>
<td>Chair: Manuel Pouchon</td>
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<td>08:30</td>
<td>Overview of US-DOE Research on Advanced Reactor Clad Material Development</td>
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<td>08:30</td>
<td>Stuart Maloy (LANL, US)</td>
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<td>08:30</td>
<td>Overview of the MYRRHA project</td>
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<td>Erich Stergar (SCK-CEN, Belgium)</td>
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<td>09:10</td>
<td>SESSION 4: ATF</td>
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<td>09:10</td>
<td>Chair: Manuel Pouchon</td>
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<td>09:10</td>
<td>Current Status and Future Prospect of Light Water Reactor Accident-Tolerant Fuels R&amp;D in Japan</td>
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<td>09:10</td>
<td>S. Yamashita (JAEA, Japan)</td>
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<td>09:30</td>
<td>Advanced surface treatments for nuclear applications</td>
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<td>09:30</td>
<td>Fanny Balbaud (CEA, France)</td>
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<td>10:20</td>
<td>Coffee</td>
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<tr>
<td>10:20</td>
<td>Performance of alumina-forming duplex stainless steels as accident tolerant fuel cladding materials</td>
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<td>10:20</td>
<td>Changheui Jang (KAIST, KOREA)</td>
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<td>10:20</td>
<td>Effect of Neutron Irradiation under Halden Reactor Water Environment on Shield SiC/SiC Cladding Property</td>
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<td>10:20</td>
<td>Akira Kohyama (NITE Corporation, Japan)</td>
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<td>11:20</td>
<td>Microstructure Analysis and Hardness Test of Irradiated Multi-Metallic Layer Composite Material for Accident Tolerant Fuel Cladding</td>
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<td>11:20</td>
<td>Taeyong Kim (Ulsan National Institute, Korea)</td>
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<td>11:20</td>
<td>Discussion</td>
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<td>13:10</td>
<td>Lunch</td>
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**SMINS-5**

8-11 July, Kyoto, Japan
SESSION 5: Advanced processes and materials
Chair: Fanny Balbaud

13:10  13:30  Advanced mitigation strategies for HLM Corrosion – GESA, AFA, HEA
Alfons Weisenburger (KIT, Germany)

13:30  13:50  Austenitic to ferritic steel functionally graded components for nuclear applications
Emmanouil Stavroulakis (Uni. Manchester, UK)

13:50  14:10  Additive Manufacturing Processes for Nuclear Power Applications
Pascal Aubry (CEA, France)

14:10  14:30  Irradiation Tolerance of Refractory BCC High-Entropy Alloys at High Temperature
Bo-Shiuan Li (Uni. of Oxford, UK)

14:30  14:50  Discussion

14:50  15:10  Coffee

Poster session
Chairs : Marta Serrano & Thierry Auger

15:10  16:25  Poster presentations (20*3 mins) (allowing for change over)

16:25  16:45  Break
16:45  18:00  Poster presentations (20*3 mins) (allowing for change over)

18:00  20:00  Poster session and drinks

Wednesday 10 July

SESSION 1: Overview of programmes
Chair: Satoshi Ohtsuka

08:30  08:50  Nuclear Materials Research in Switzerland
Manuel Pouchon (PSI, Switzerland)

08:50  09:10  The Status and Challenges in Development of Fusion Reactor Materials in China
Yugang Wang (Peking Uni., China)

09:10  09:30  Materials Research for Fission Nuclear Power Reactors in China
En-Hou Han (China)

SESSION 6: Metal alloys for advanced systems
Chair: Stuart Maloy

09:30  09:50  Improved creep properties of G91 steel by thermo-mechanical treatments
Marta Serrano (CIEMAT, Spain)

09:50  10:10  The behaviours of solute elements and spallation transmutants at grain boundaries and precipitate-matrix interfaces in F82H steel after irradiation with high-energy protons and spallation neutrons
Yong Dai (PSI, Suisse)

10:10  10:40  Coffee
10:40  11:00  Embrittlement of neutron-irradiated austenitic steel at high dose: ductile fracture modelling based on SEM and TEM microstructural characterization
Arnaud Courcelle (CEA, France)

11:00  11:20  Study of effects of low concentration Helium on tensile properties of Tungsten by Helium
Akira. Hasegawa (Tohoku Uni., Japan)

11:20  11:40  Intermediate temperature embrittlement in nickel alloys for molten salt reactors
Thierry Auger (CNRS, France)

11:40  12:00  Discussion

12:00  13:20  Lunch

Panel discussion
“How to fast track innovative materials through to application”
Chair: James Marrow

13:20  13:50  Integrated computational materials engineering (ICME) vs. integrated computational alloy design
Franck Tancret (Uni. Nantes, France)

Frédéric Schuster (CEA, France)

14:20  14:50  Ions versus neutrons irradiations
Steve Zinkle (ORNL, US)

14:50  15:20  Irradiation induced defect production and microstructural evolution in tunable concentrated solid-solution alloys
William Weber (Uni. Tennessee, US)

15:20  15:45  Coffee

15:45  17:00  Panel discussion

19:00  22:00  Dinner at Sodoh restaurant

Thursday 11 July

SESSION 1: Overview of programmes
(Chair: Erich Stergar)

08:30  08:50  The European GEMMA project – overview and first neutron diffraction measurements of stress field in welds
Pietro Agostini (ENEA, Italy)

08:50  09:10  Status of the IAEA Coordinated Research Projects (CRPs) on Fuel Modelling and Ion Accelerator Simulation of Radiation Effects (SMoRE-2) and on Analysis of Options and Experimental Examination of Fuels with Increased Accident Tolerance (ACTOF)
Mikhail Veshchunov (IAEA)
09:10 09:30  The Generation IV International Forum Advanced Manufacturing and Materials Engineering Task Force
Lyndon Edwards (GIF)

SESSION 6: Metal alloys for advanced systems
Chair: Yong Dai

09:30 09:50 Prediction of Creep and Creep-Fatigue Damage of Alloy 617 for Application in VHTR Systems
Ondrej Muransky (ANSTO, Australia)

09:50 10:20 Coffee

10:20 10:40 Irradiation effects of ADS component materials on compatibility with liquid lead bismuth alloy
Nariaki Okubo (JAEA, Japan)

10:40 11:00 Testing of 15-15Ti stainless steel cladding for the ALLEGRO gas-cooled fast reactor
Márton Kiraly (MTA EK, Hungary)

11:00 11:20 Discussion

11:20 11:50 Meeting Summary from the session chairs

11:50 12:00 Closing speech