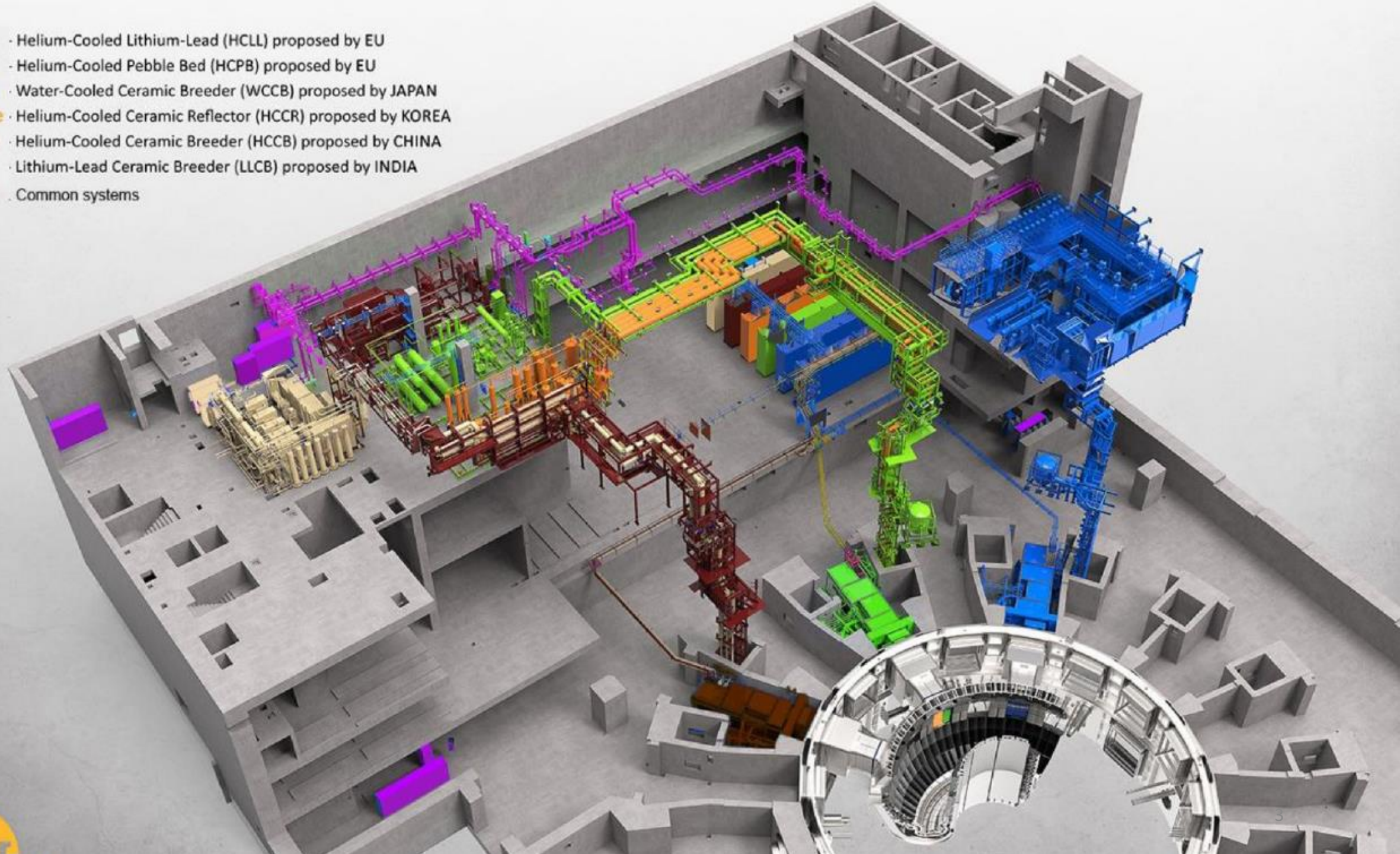
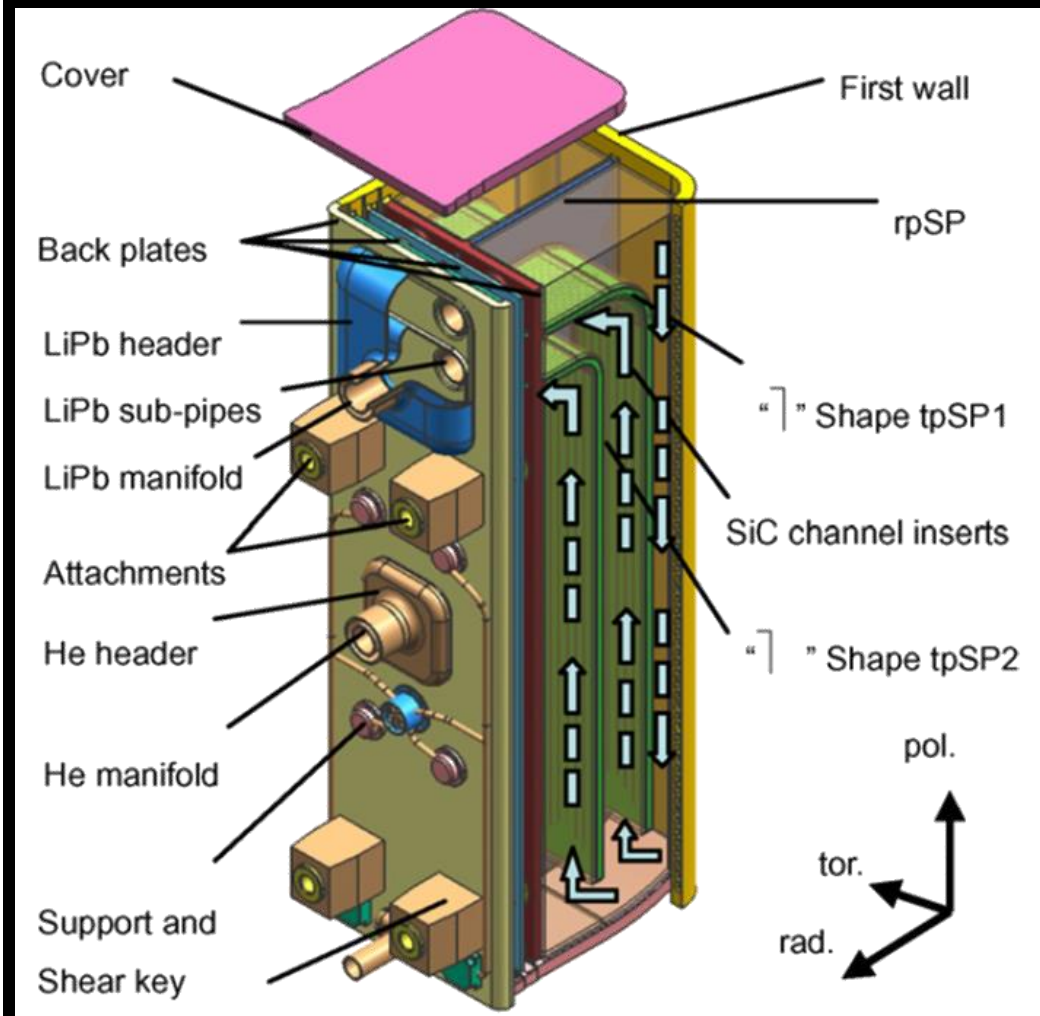
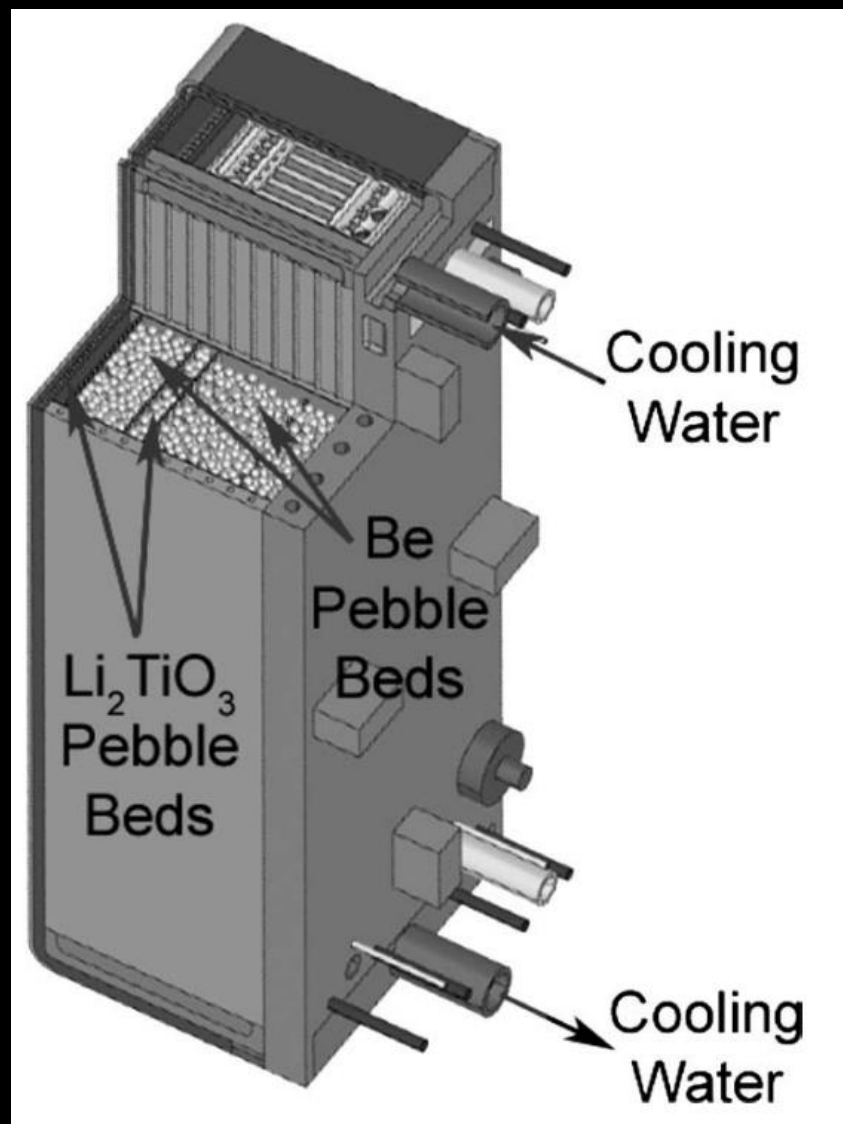
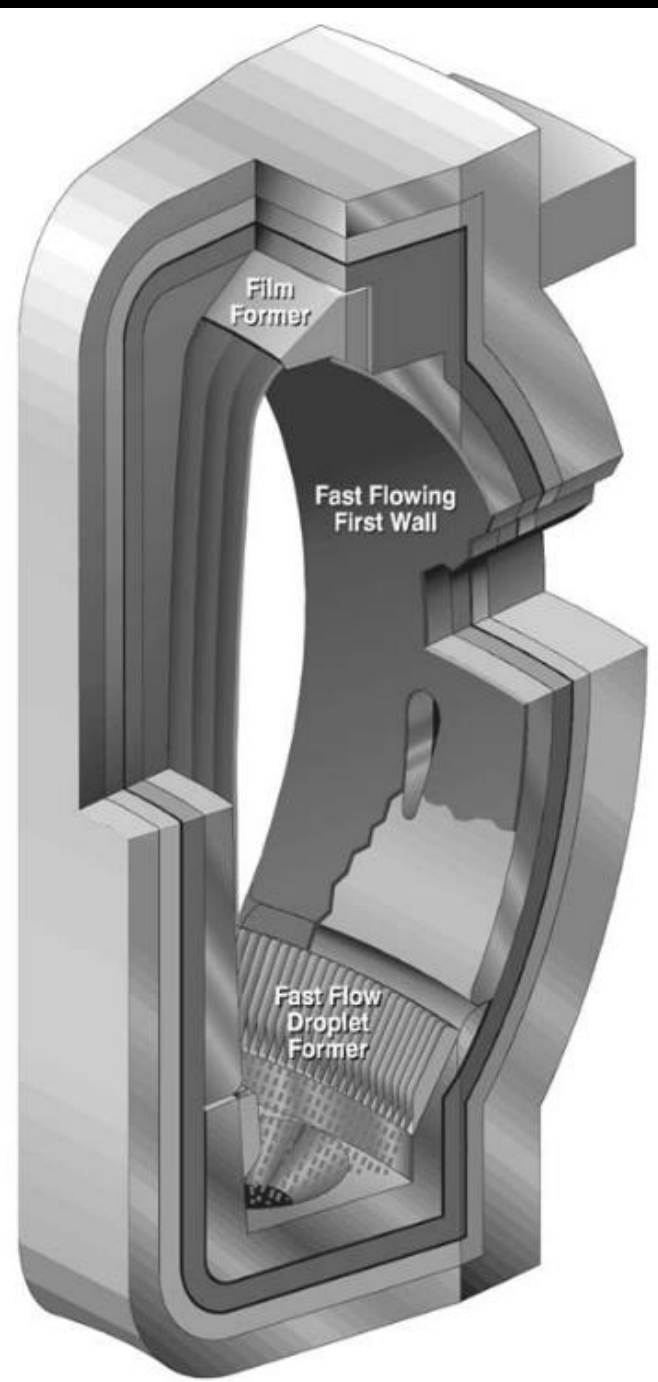


HEAT

- Blue** · Helium-Cooled Lithium-Lead (HCLL) proposed by EU
- Blue** · Helium-Cooled Pebble Bed (HCPB) proposed by EU
- Green** · Water-Cooled Ceramic Breeder (WCCB) proposed by JAPAN
- Orange** · Helium-Cooled Ceramic Reflector (HCCR) proposed by KOREA
- Brown** · Helium-Cooled Ceramic Breeder (HCCB) proposed by CHINA
- Ivory** · Lithium-Lead Ceramic Breeder (LLCB) proposed by INDIA
- Violet** · Common systems





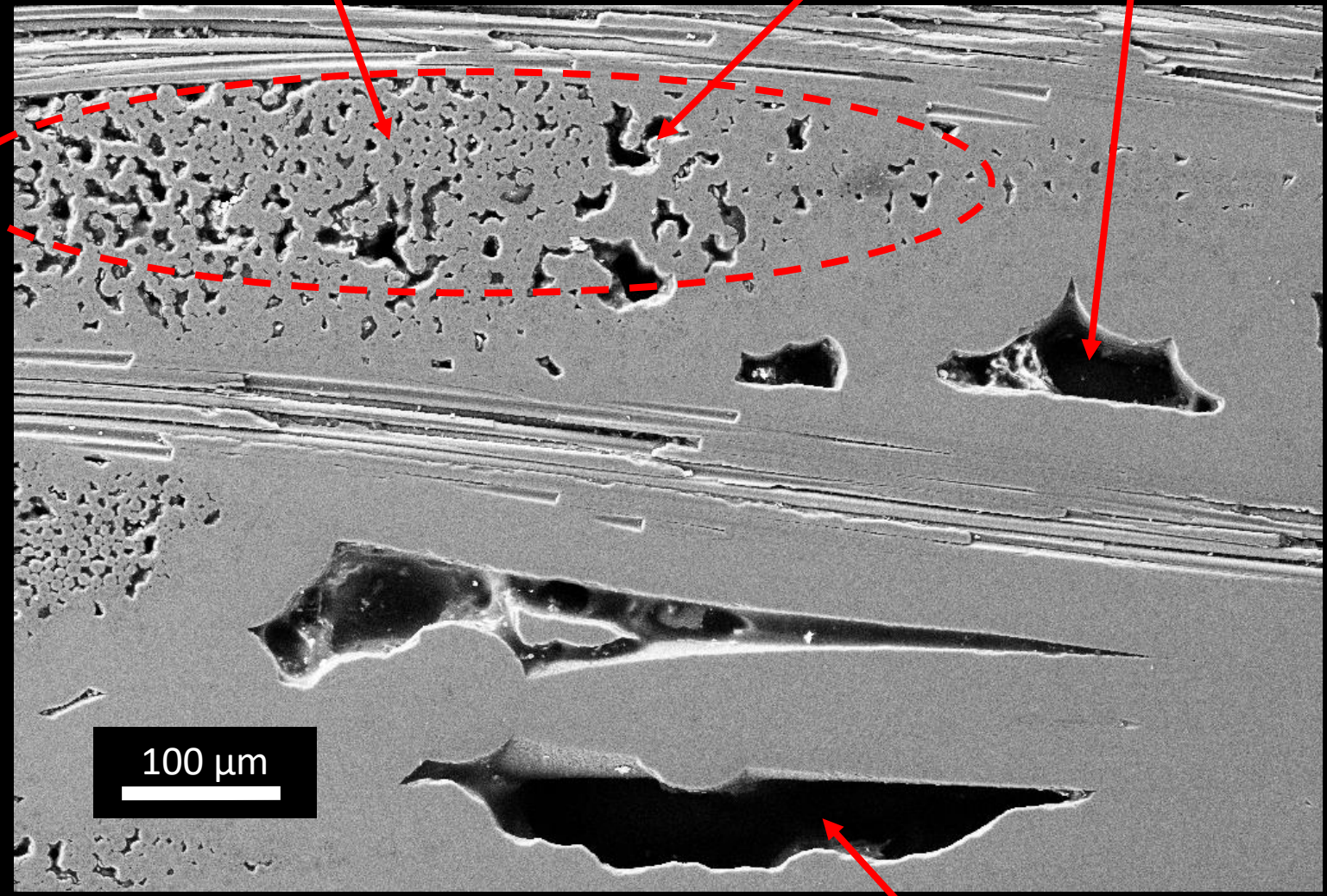
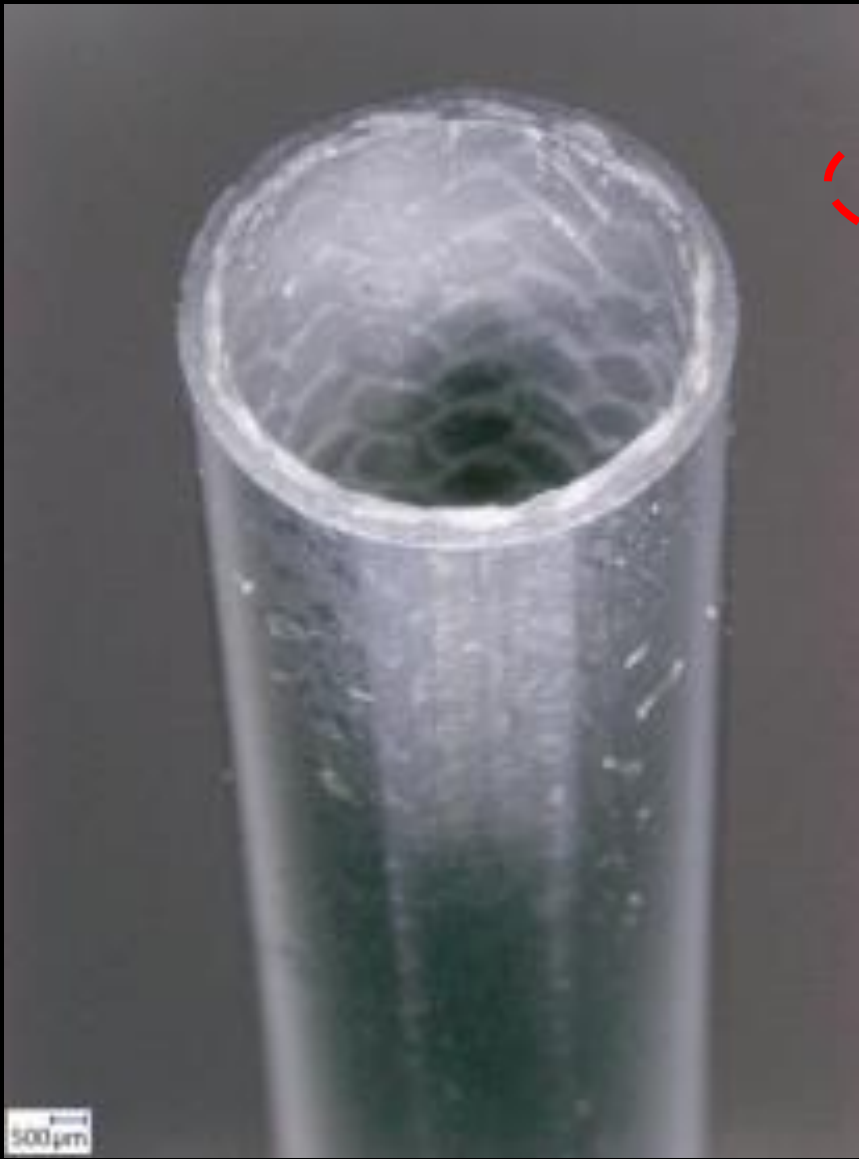
TAURO blanket concept design
made of SiC/SiC



SiC/SiC composites

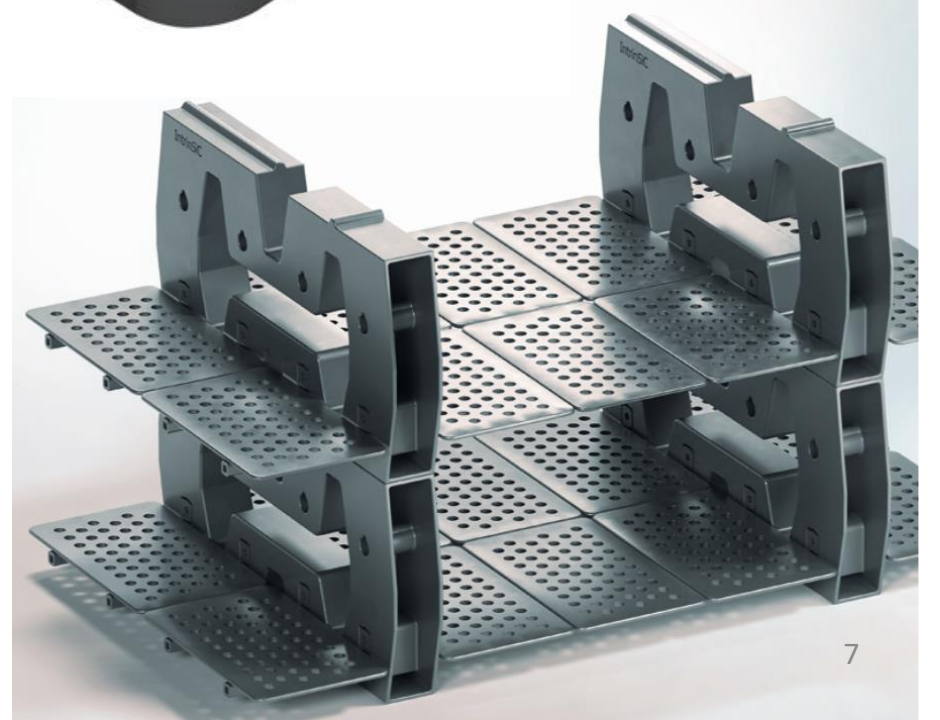
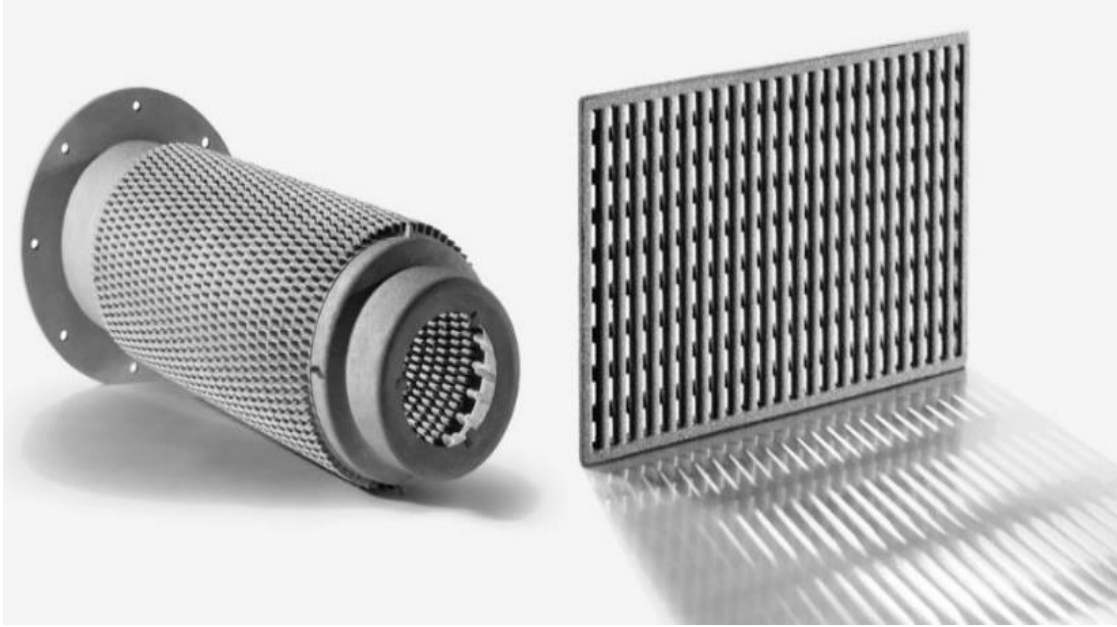
Fiber bundle, normal to the surface

Inter-fiber porosity



Inter-bundle porosity

Reaction-bonded Silicon Carbide



Single Material Joining of Silicon-Infiltrated Silicon Carbide (SiSiC)

H.C. Starck Ceramics is an expert of technical ceramics products and a leading producer of components made from oxide and non-oxide ceramics.

SiSiC from H.C. Starck Ceramics enables joining with excellent material and mechanical properties for the final product. In the process, the individual components are bonded together using the same material. This is a leading edge for the production of large-size components, parts with undercuts and designs with cooling channels.

Our SiSiC advantages:

- > Production of large-size components
- > Extremely homogeneous material
- > Joining areas with identical material properties, such as E modulus and strength
- > Material without contamination of the bulk material with impurities
- > High stiffness
- > High strength
- > Low coefficient of thermal expansion
- > Superior reliability

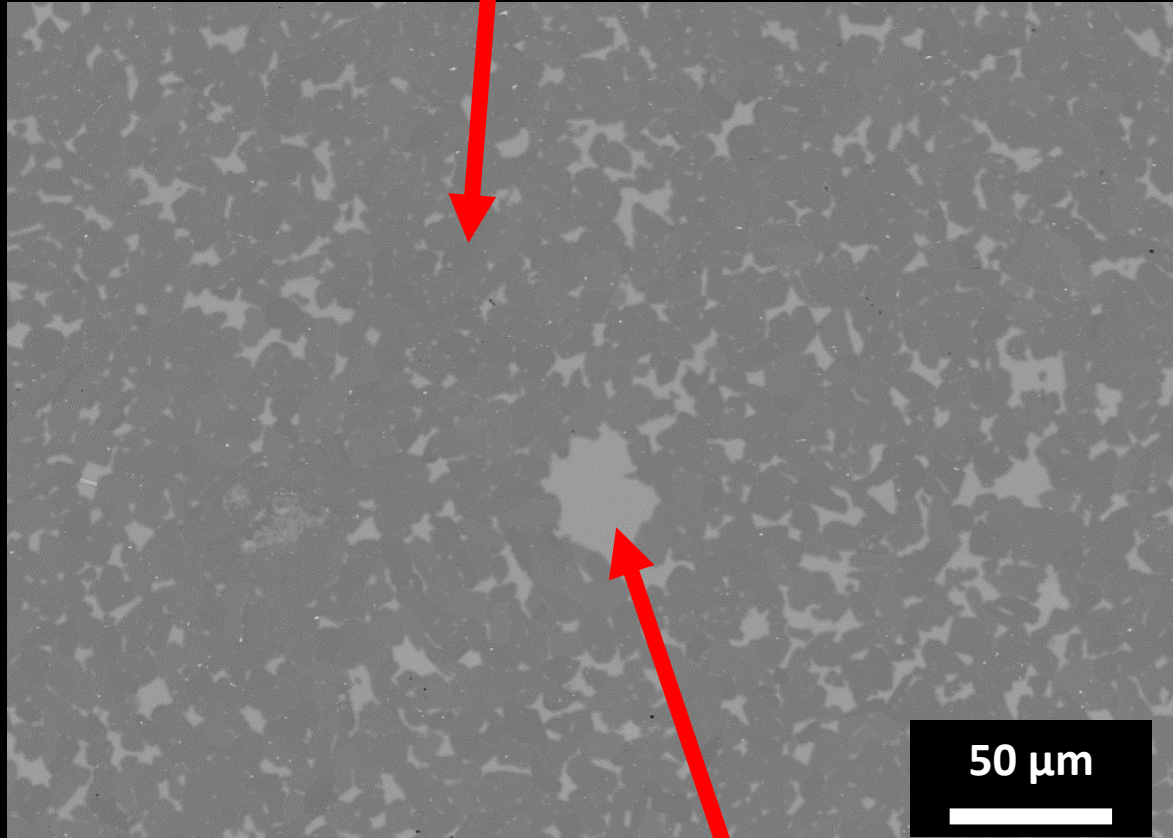
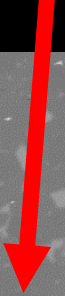
> Joining areas with identical material properties, such as E modulus and strength

maximum dimensions of approximately 950 x 950 x 500 mm.

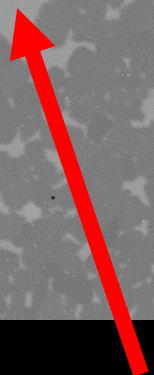
We produce components from SiSiC with the maximum dimensions of approximately 950 x 950 x 500 mm.

Do you have any further questions about our material or would you like to discuss the material-specific feasibility of your components? Please do not hesitate to contact us.

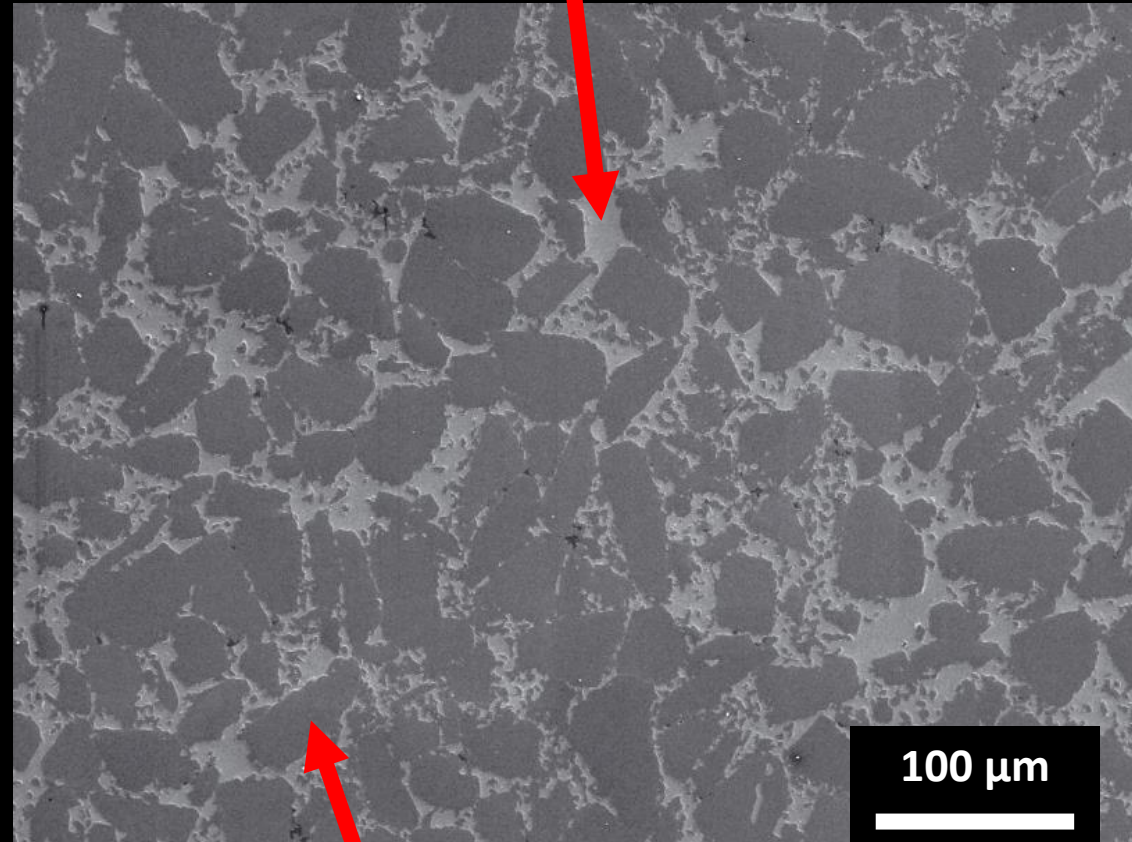
SiC



Si



Si



SiC



IRRADIATION DAMAGE IN REACTION-BONDED SILICON CARBIDE

R.B. MATTHEWS

Atomic Energy of Canada Limited, Whiteshell Nuclear Research Establishment, Pinawa, Manitoba ROE 1L0, Canada

RADIATION DAMAGE IN SILICON CARBIDE AND GRAPHITE FOR FUSION REACTOR FIRST WALL APPLICATIONS *

Received 12 November 1973

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General Electric Corporate Research and Development, Power Generation and Control, Schenectady, NY 12301, USA

Received 9 November 1978

EFFECTS OF NEUTRON IRRADIATION AND SUBSEQUENT ANNEALING ON STRENGTH AND TOUGHNESS OF SiC CERAMICS

T. ISEKI, T. MARUYAMA, T. YANO and T. SUZUKI,

Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology, O-okayama, Meguro-ku, Tokyo 152, Japan

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Department of Materials Science and Engineering, Tokyo Institute of Technology, Midori-ku, Yokohama 227, Japan

Received 12 November 1987; accepted 28 June 1989

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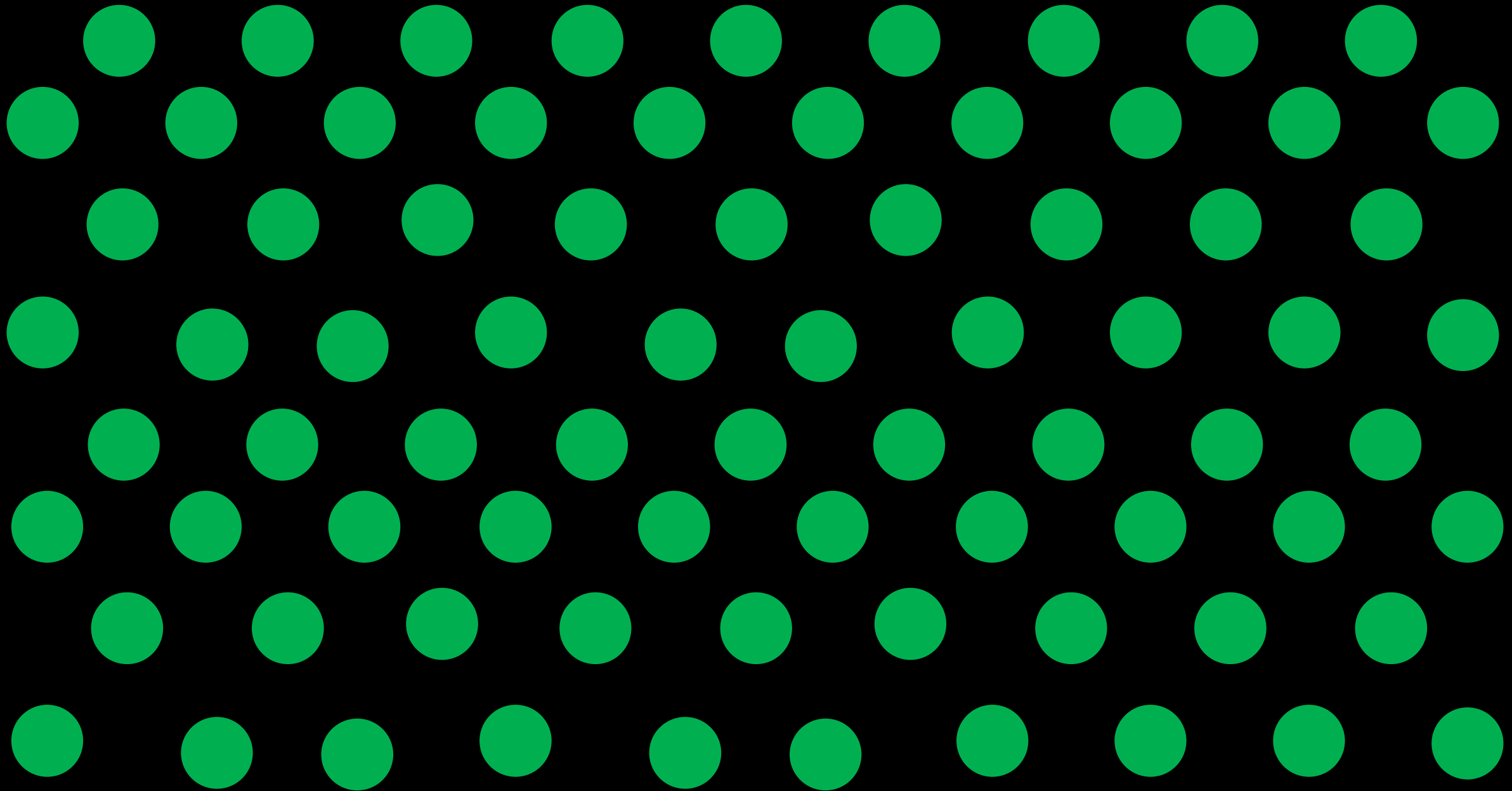
Investigation of the residual stress in reaction-bonded SiC under irradiation

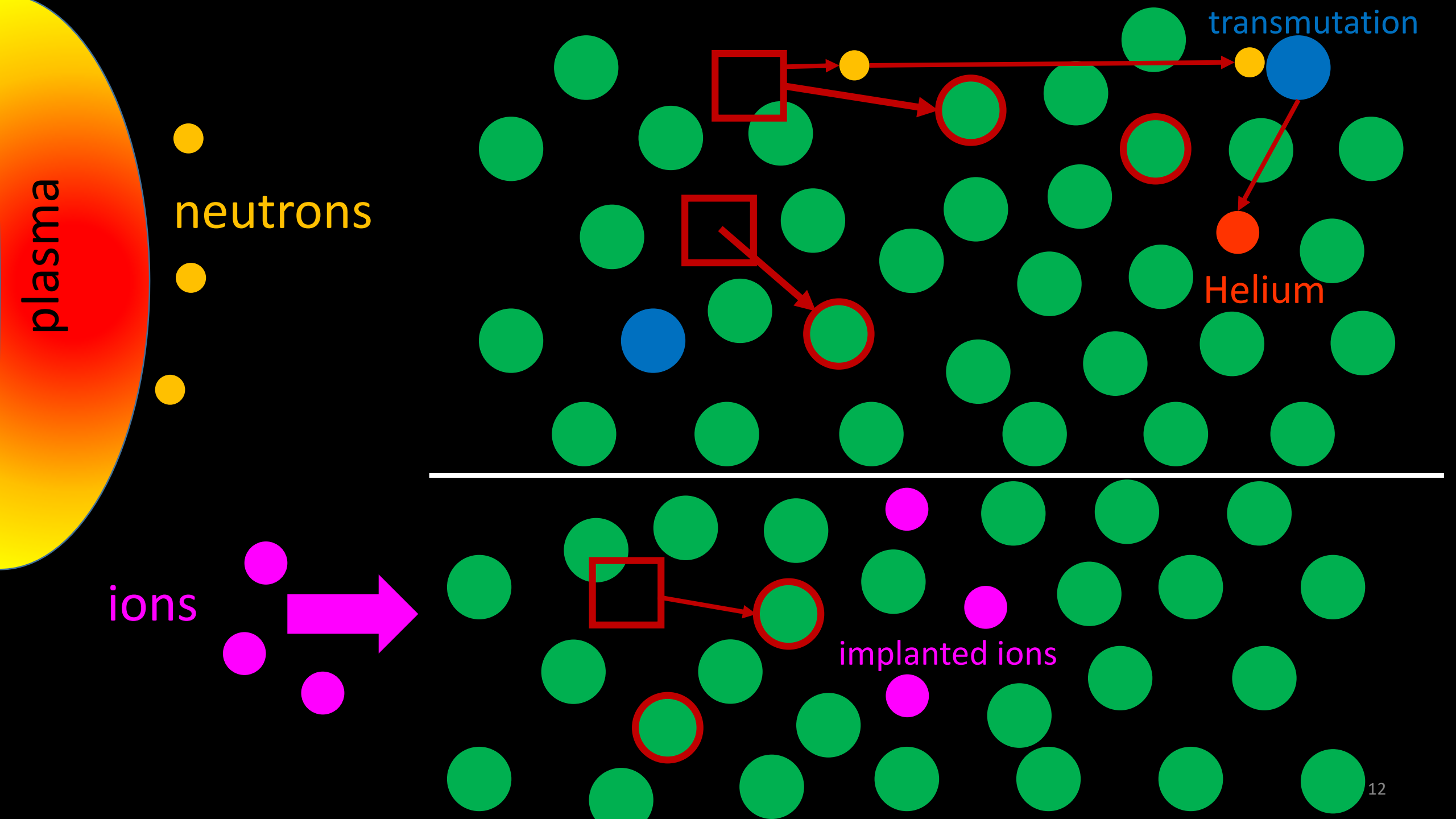


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^b State Key Laboratory of Nuclear Physics and Technology, Department of Technical Physics, Peking University, Beijing 100871, China





plasma

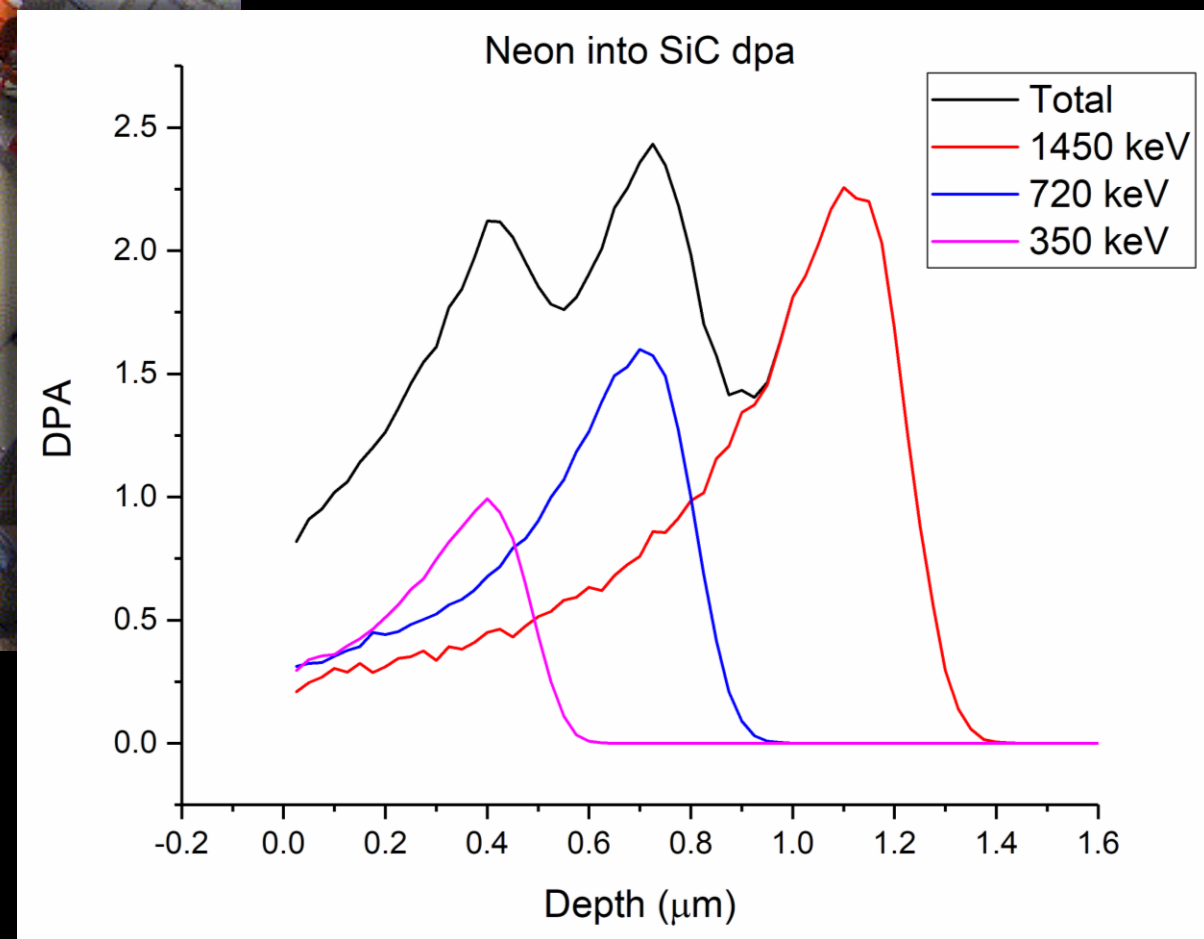
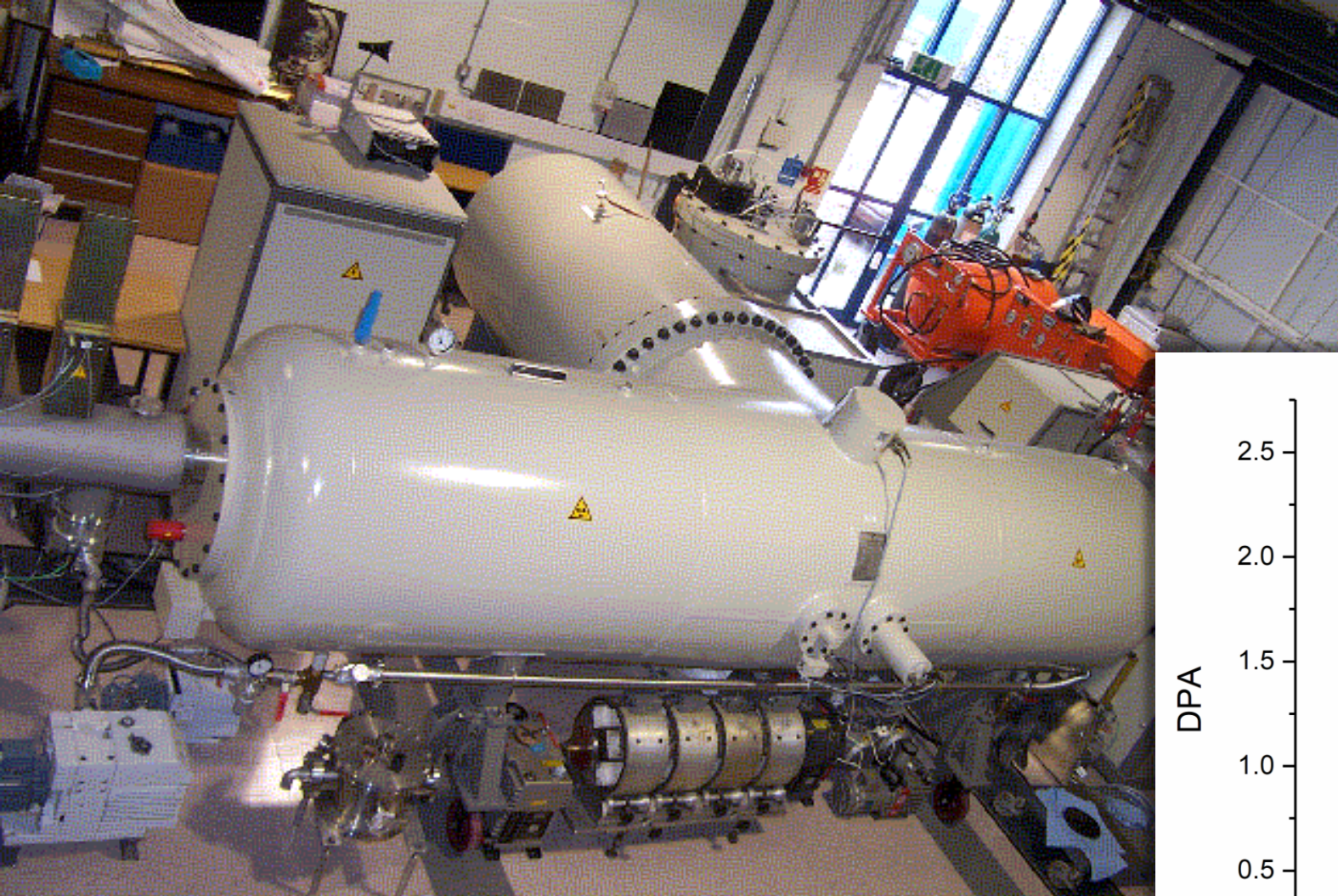
neutrons

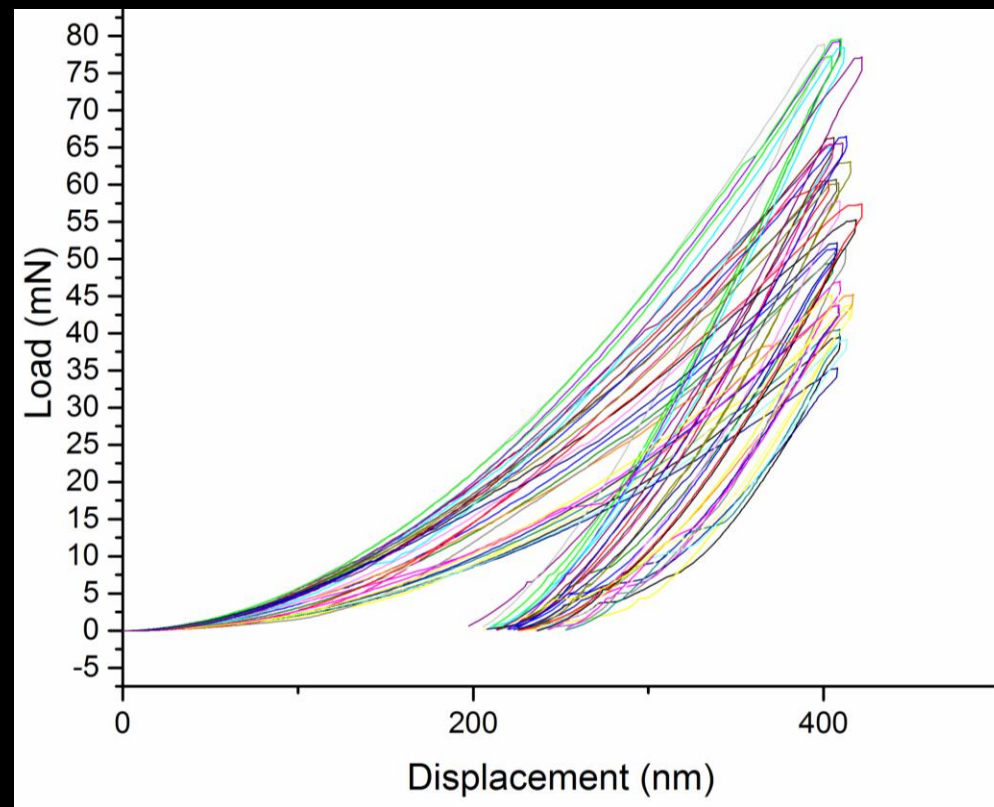
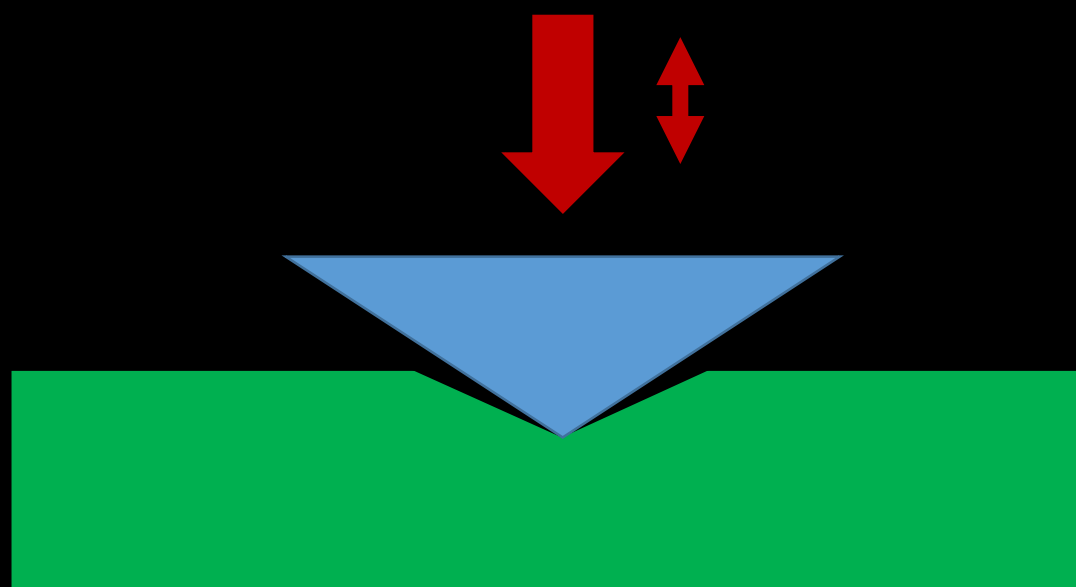
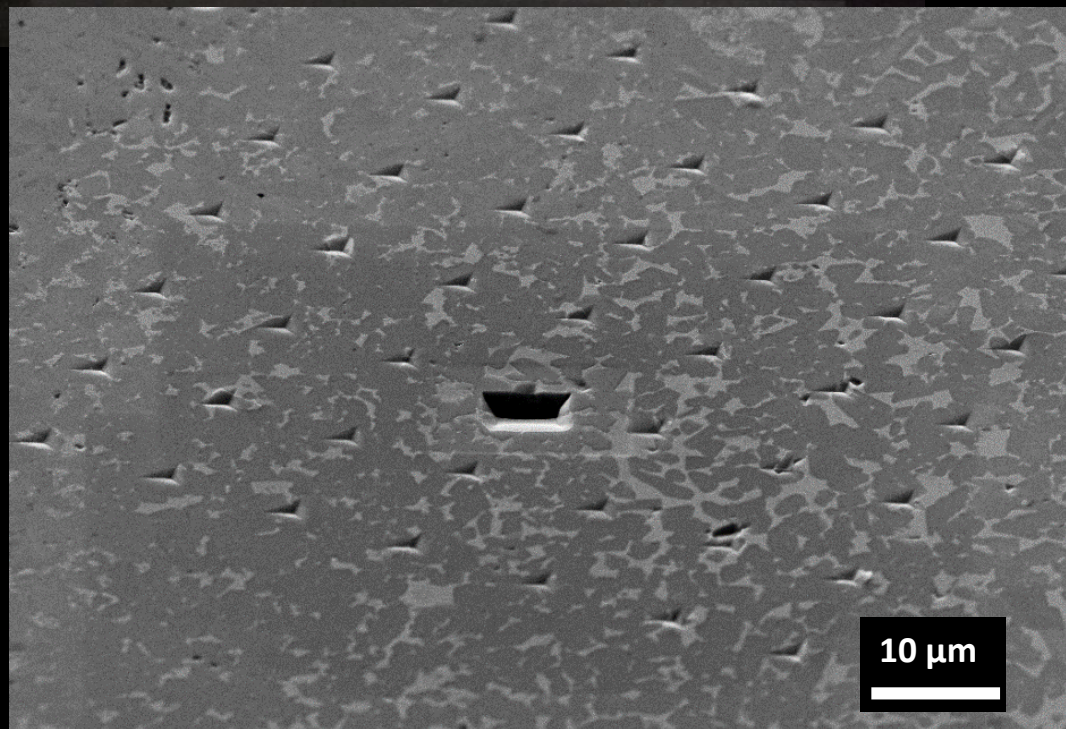
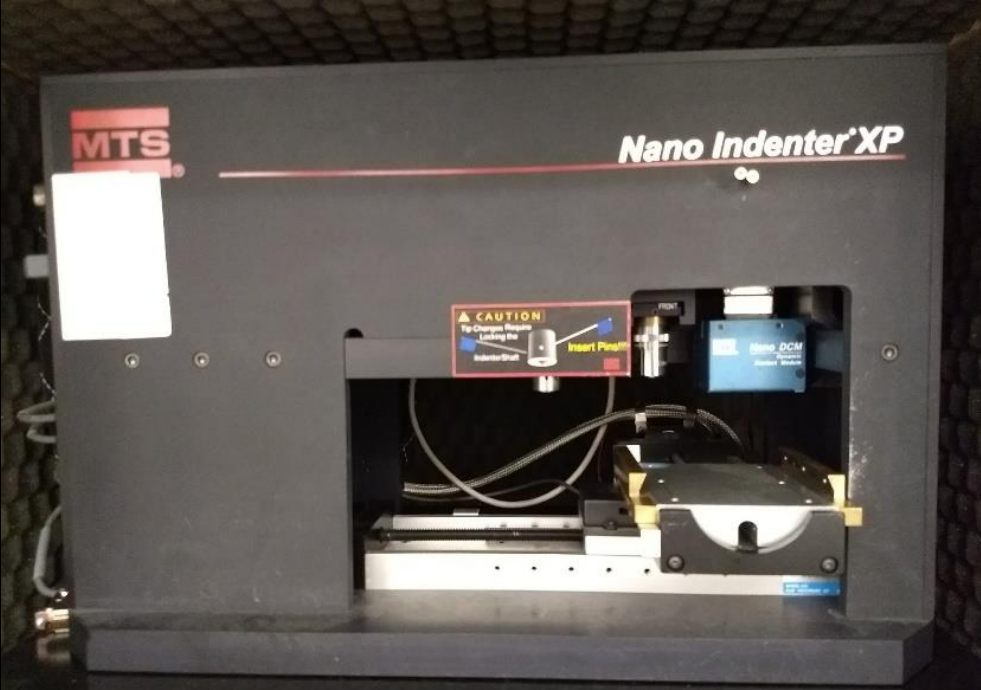
transmutation

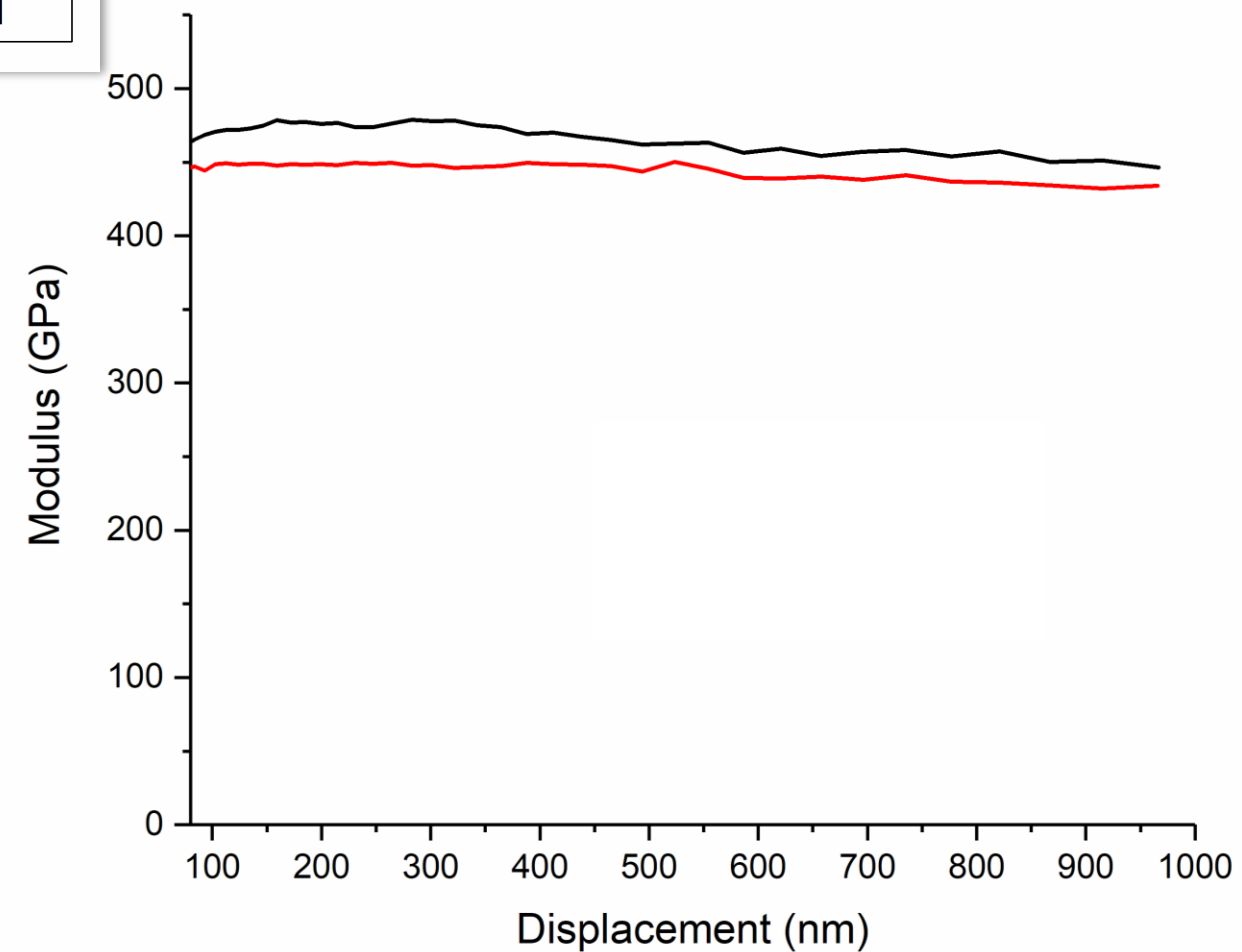
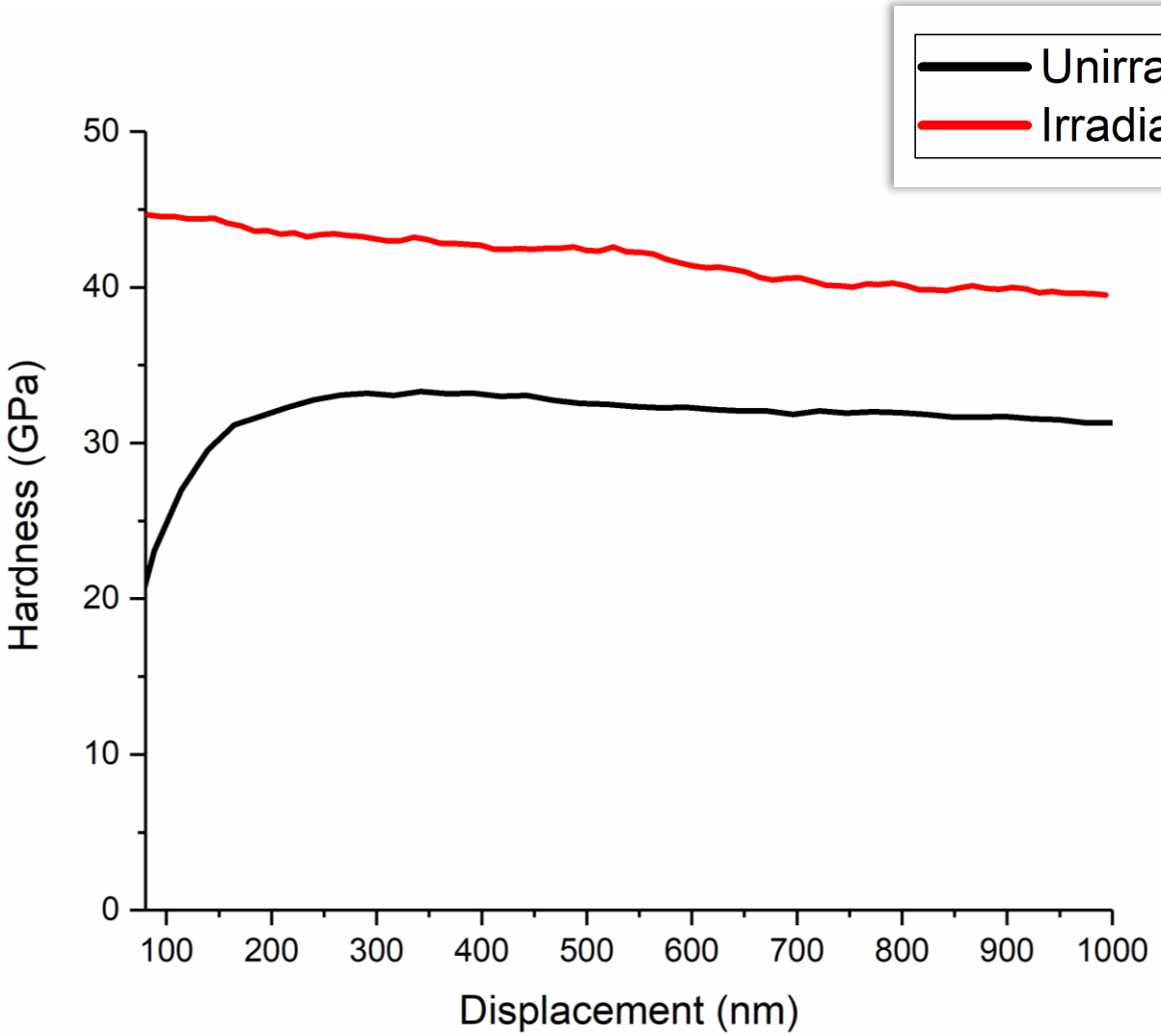
Helium

ions

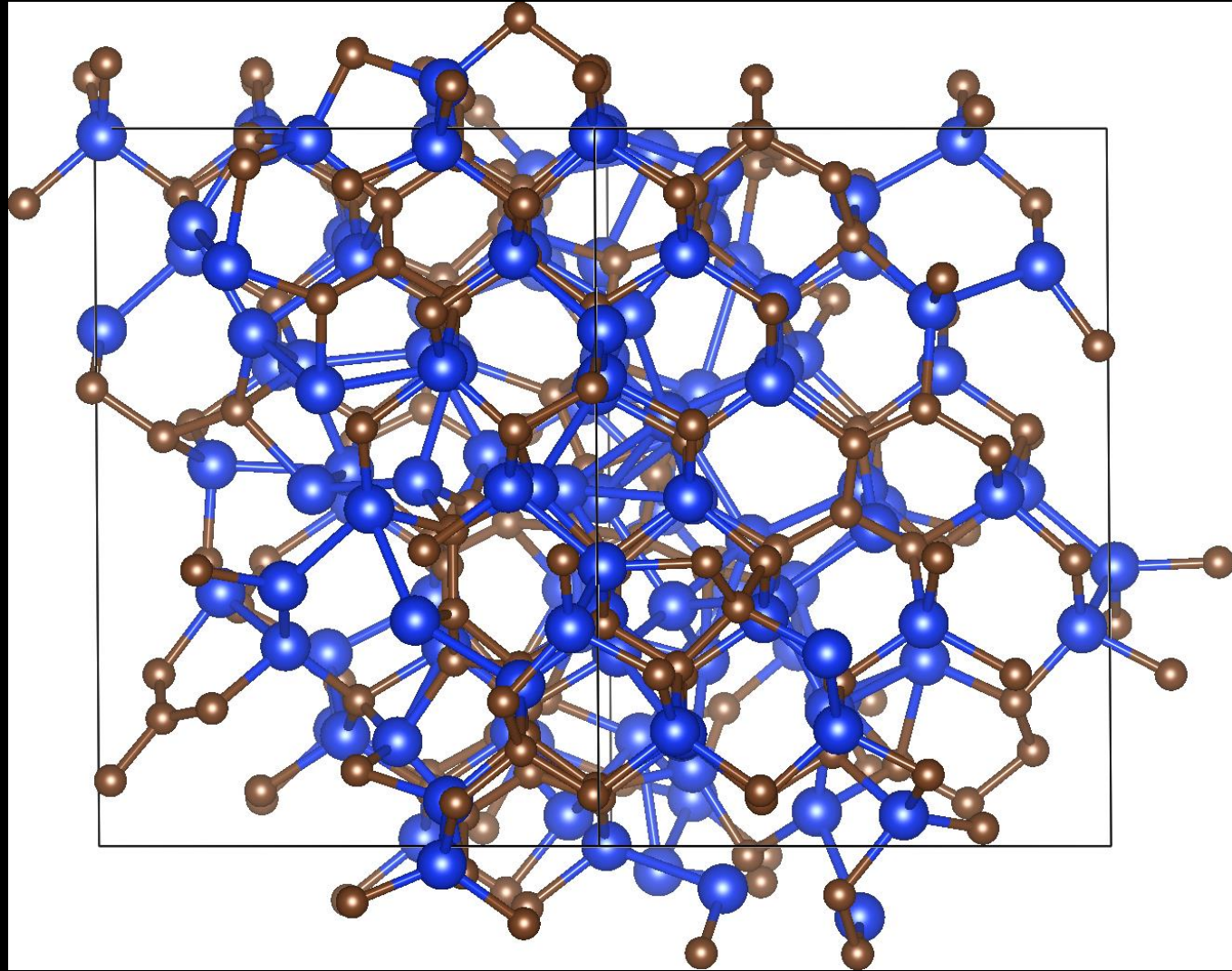
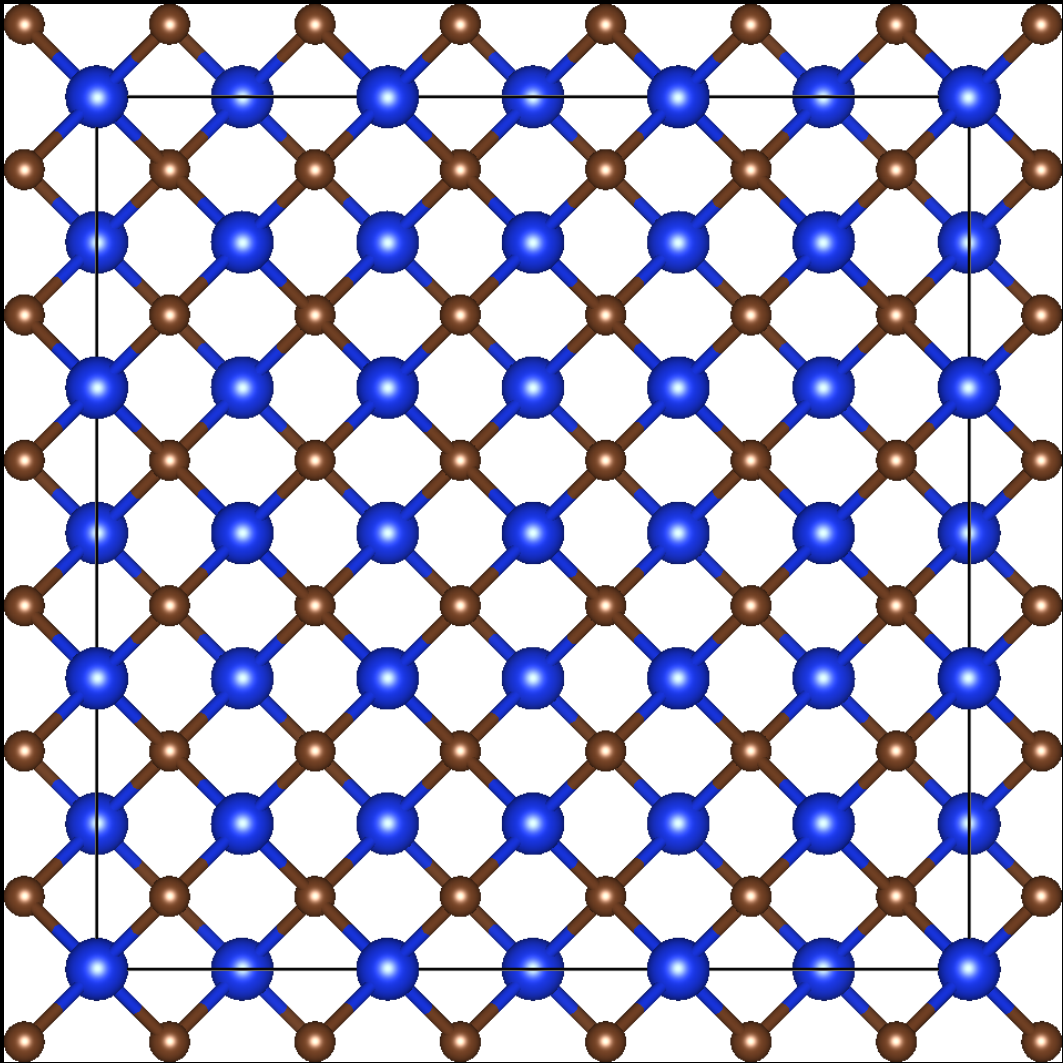
implanted ions

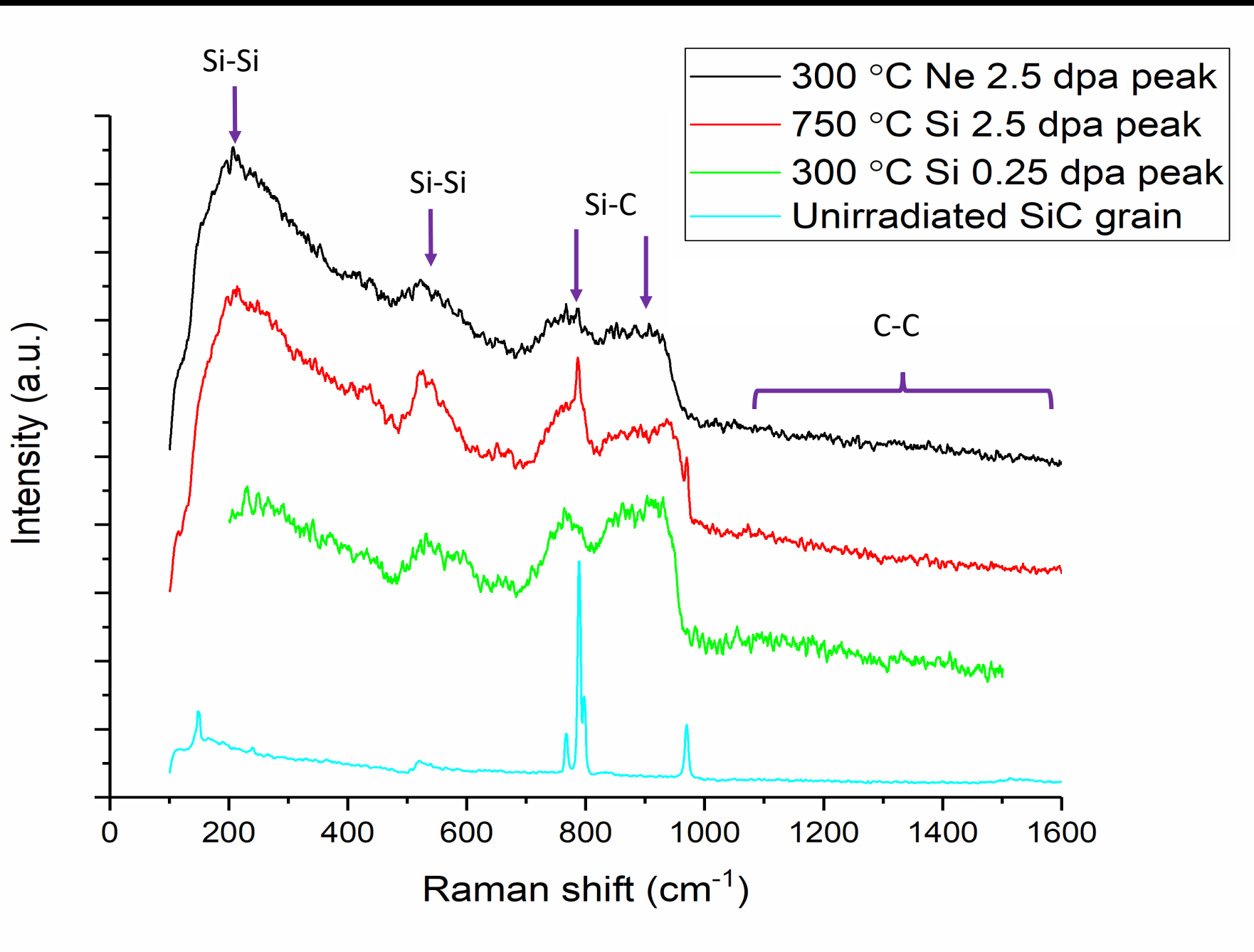


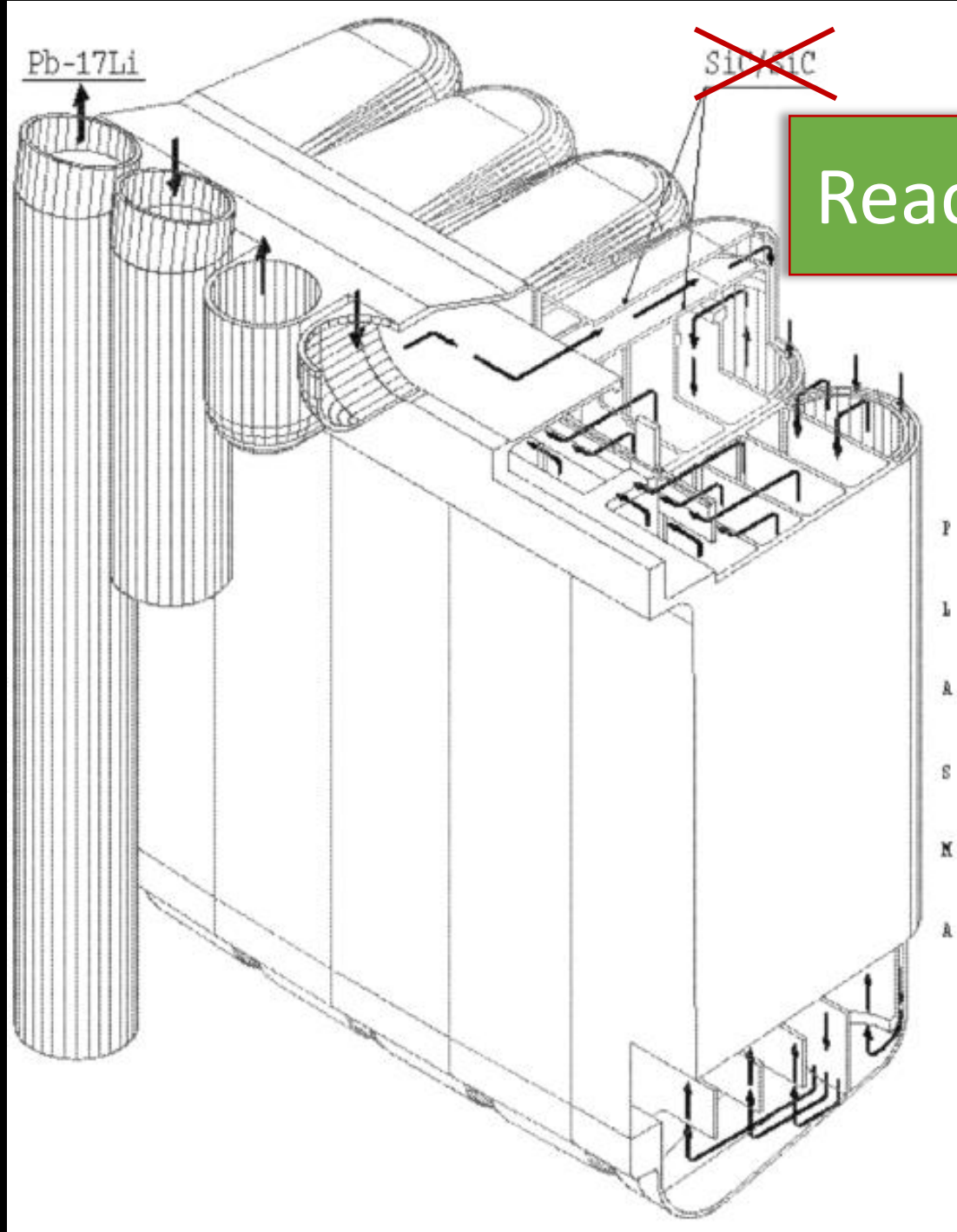




Radiation damage causes hardening and reduces stiffness







Reaction-bonded SiC?

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Slide 3: Giancarli *et al.* Fusion Eng. Des. (2018) 1-7

Slide 4: Abdou *et al.* Nucl. Eng. Technol. 37 (2005) 401-422 | Enoda *et al.* Fusion Eng. Des. (2006) 415-424,

Slide 5: Giancarli *et al.* Fusion Eng. Des. (2002) 307-318

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