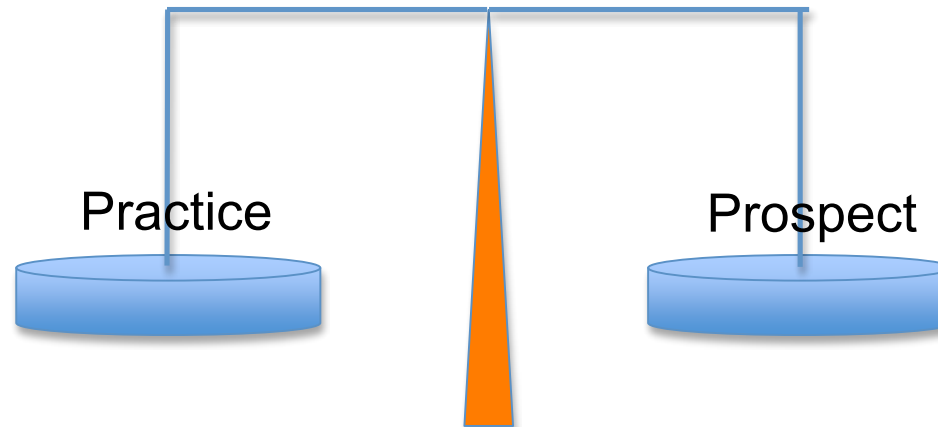
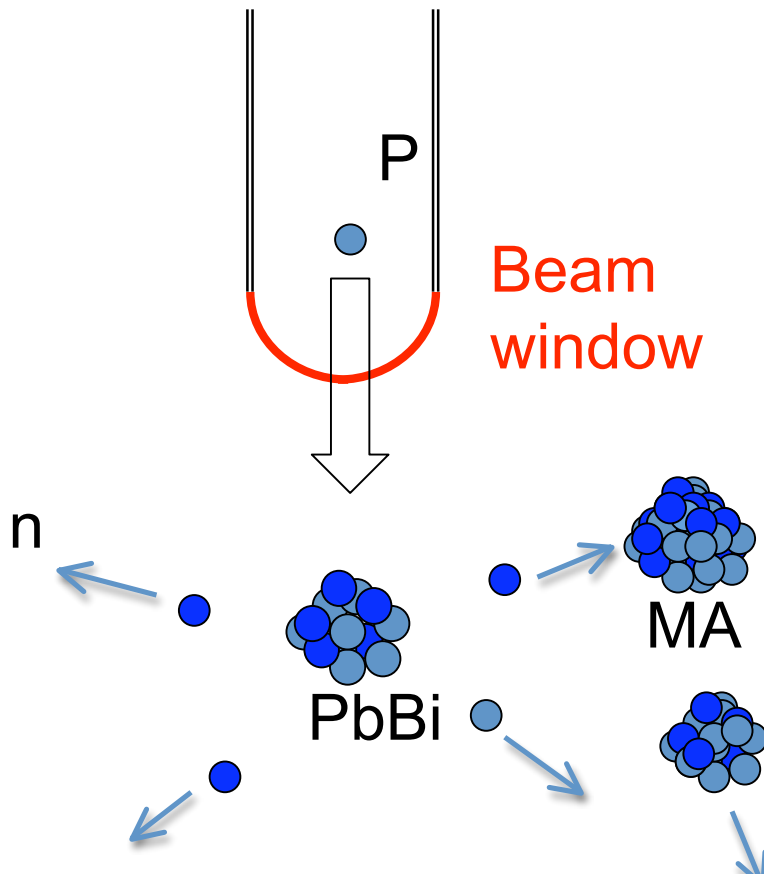
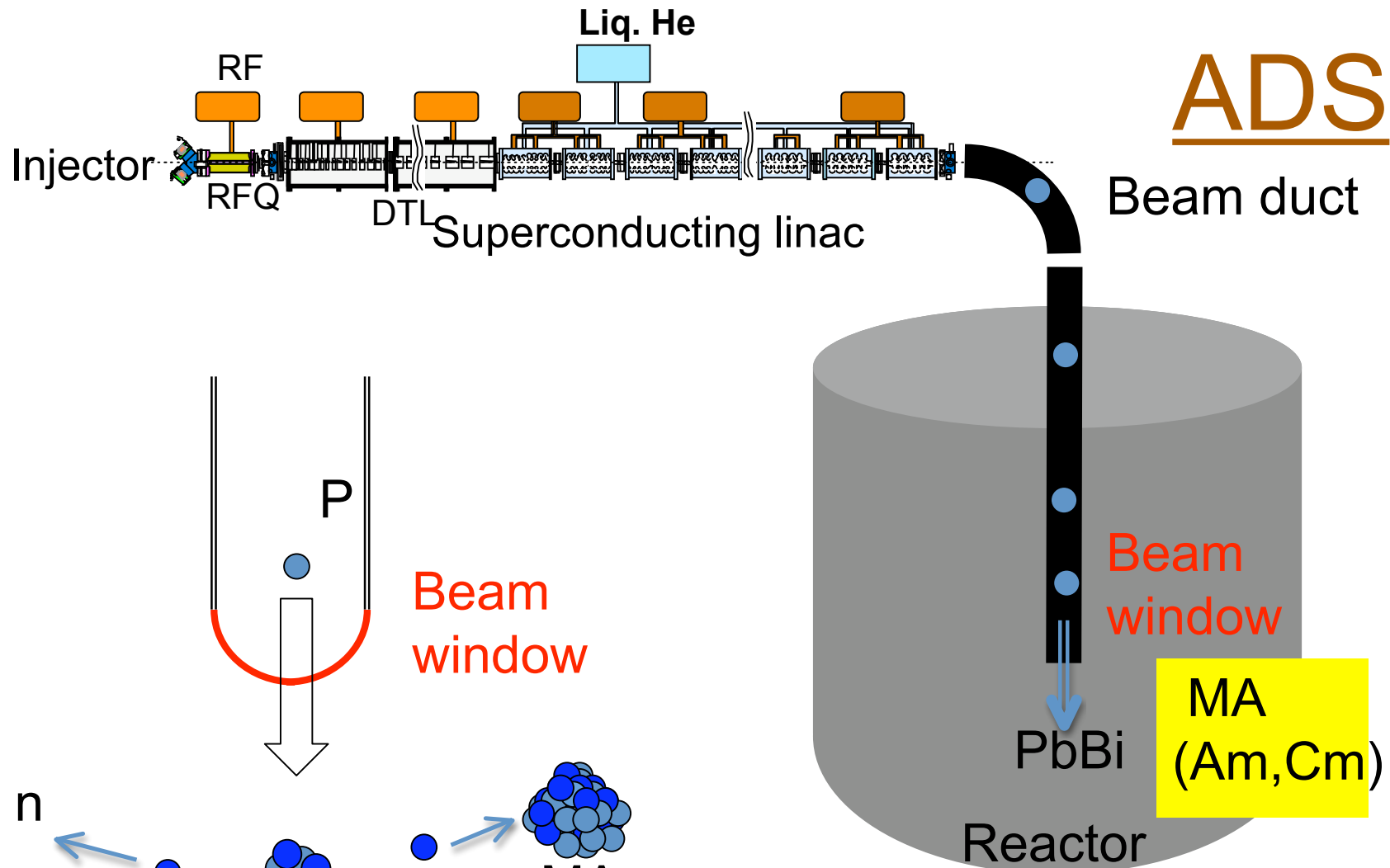


# MATERIAL DEVELOPMENT IN LEAD BISMUTH SPALLATION TARGET SYSTEM

Kenji KIKUCHI, Shigeru SAITO, Dai  
HAMAGUCHI, Masao TEZUKA, Hironari  
OBAYASHI

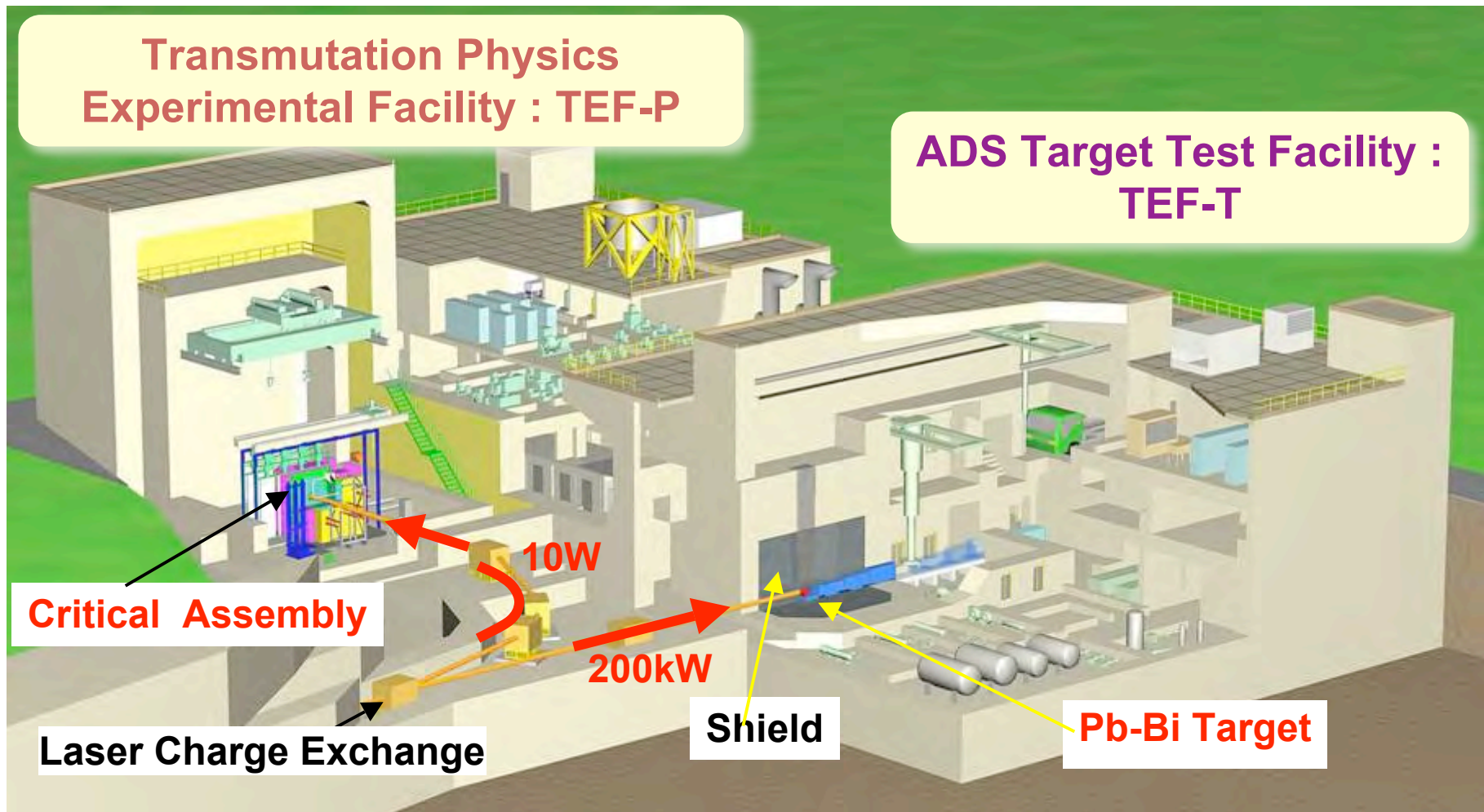
/ J-PARC Center





**The Achilles' tendon is a beam window in ADS. We will replace every ?-year.**

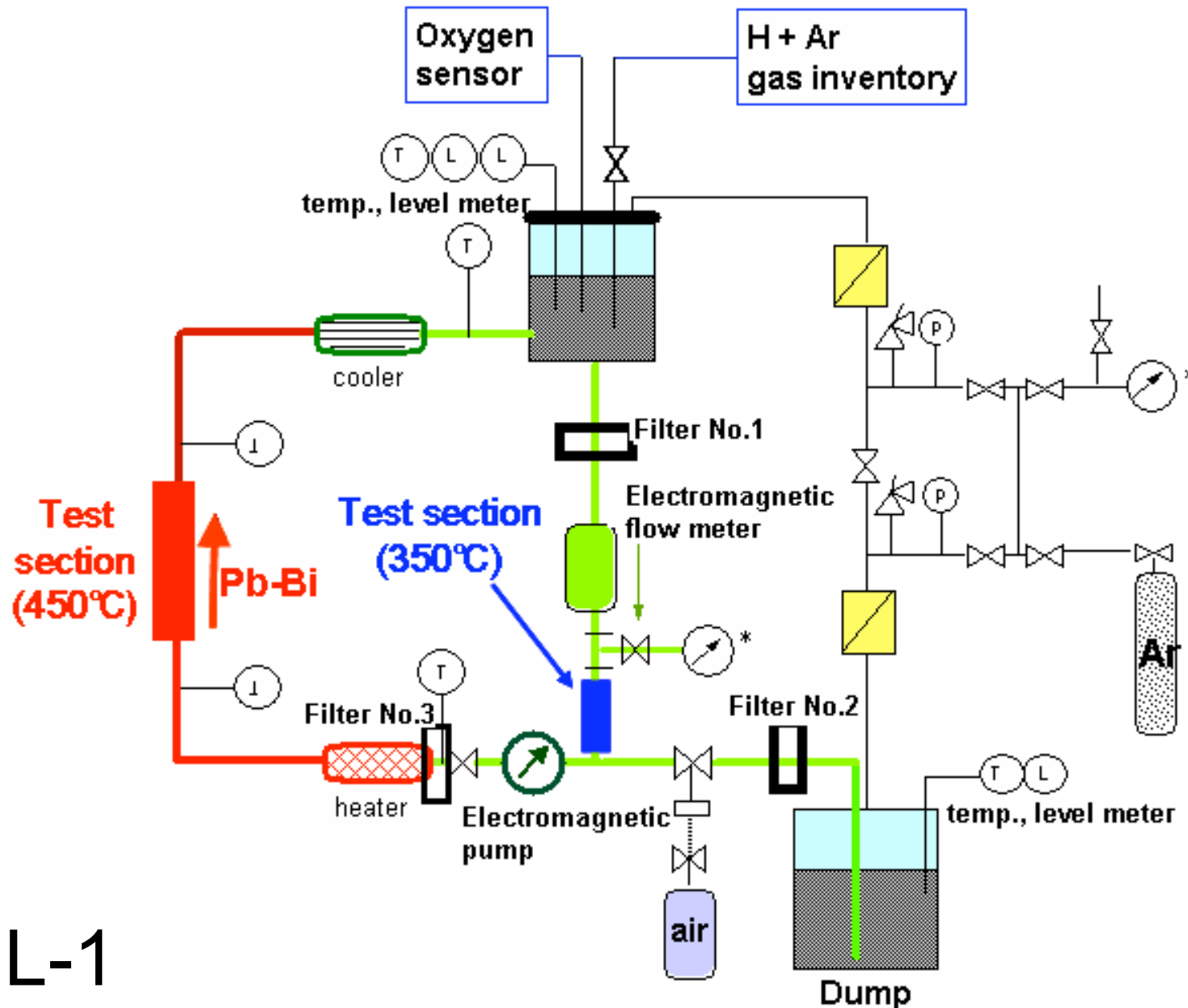
# Transmutation Experimental Facility (TEF)



# ADS Target test facility

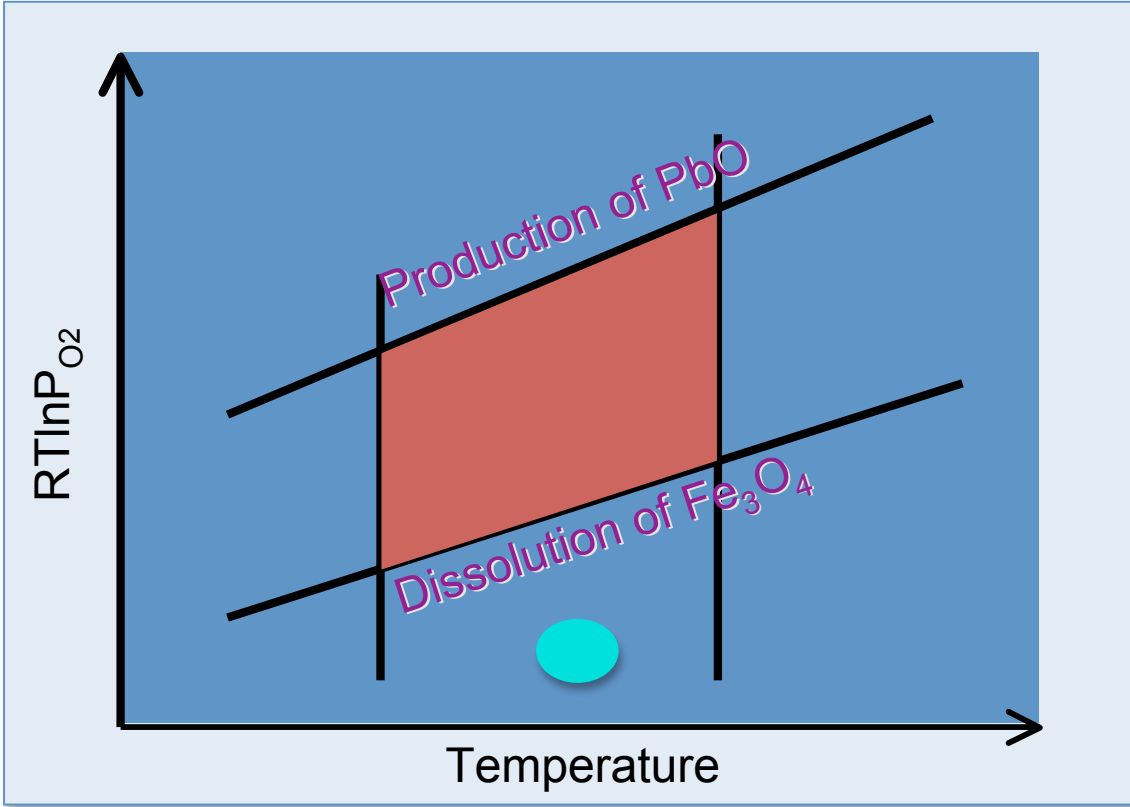
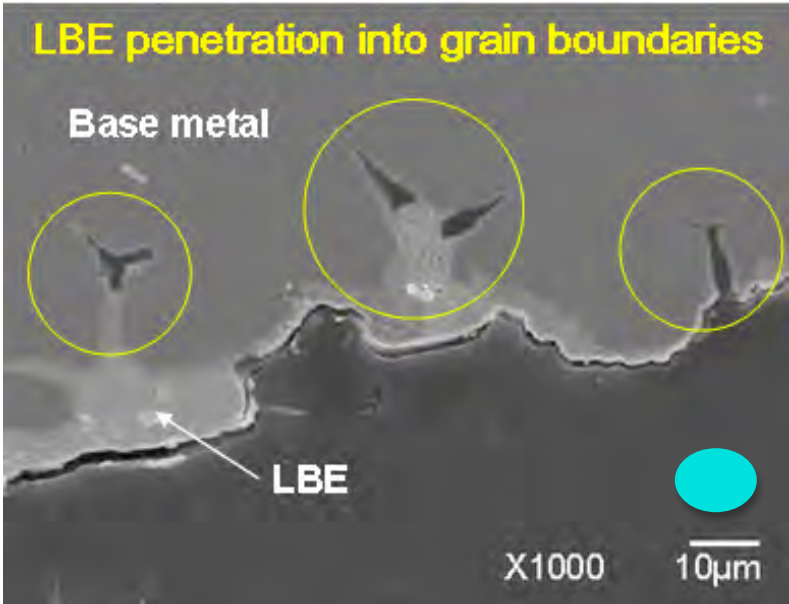
- LBE spallation target test had planned in J-PARC phase II program.
- LBE controlling techniques acquisition was a goal of R&Ds.
- LBE loops were run for corrosion-erosion (JLBL-1), target model (JLBL-2) and thermal fluid (JLBL-3)
- Proton irradiation depended on SINQ at PSI(STIP & MEGAPIE).

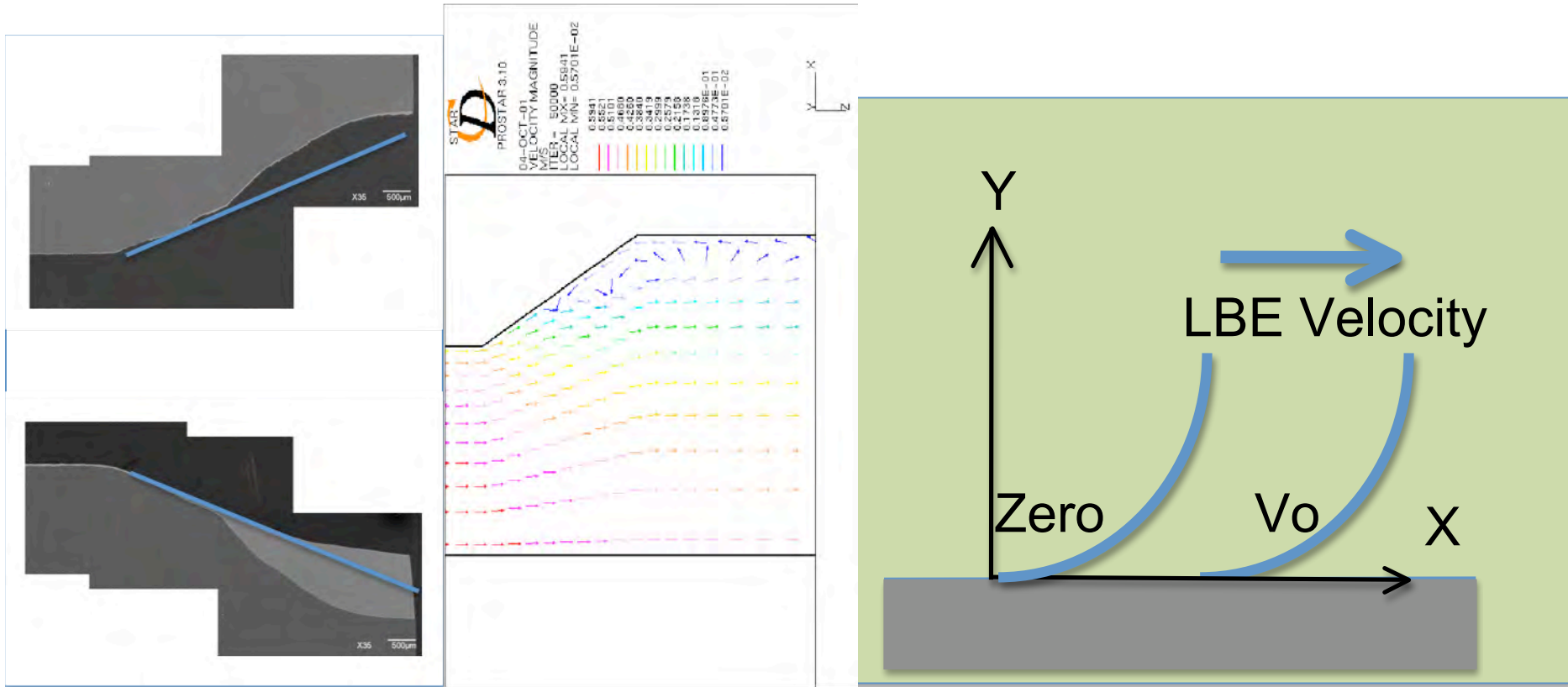
# Lead Bismuth Loop - 1 for corrosion



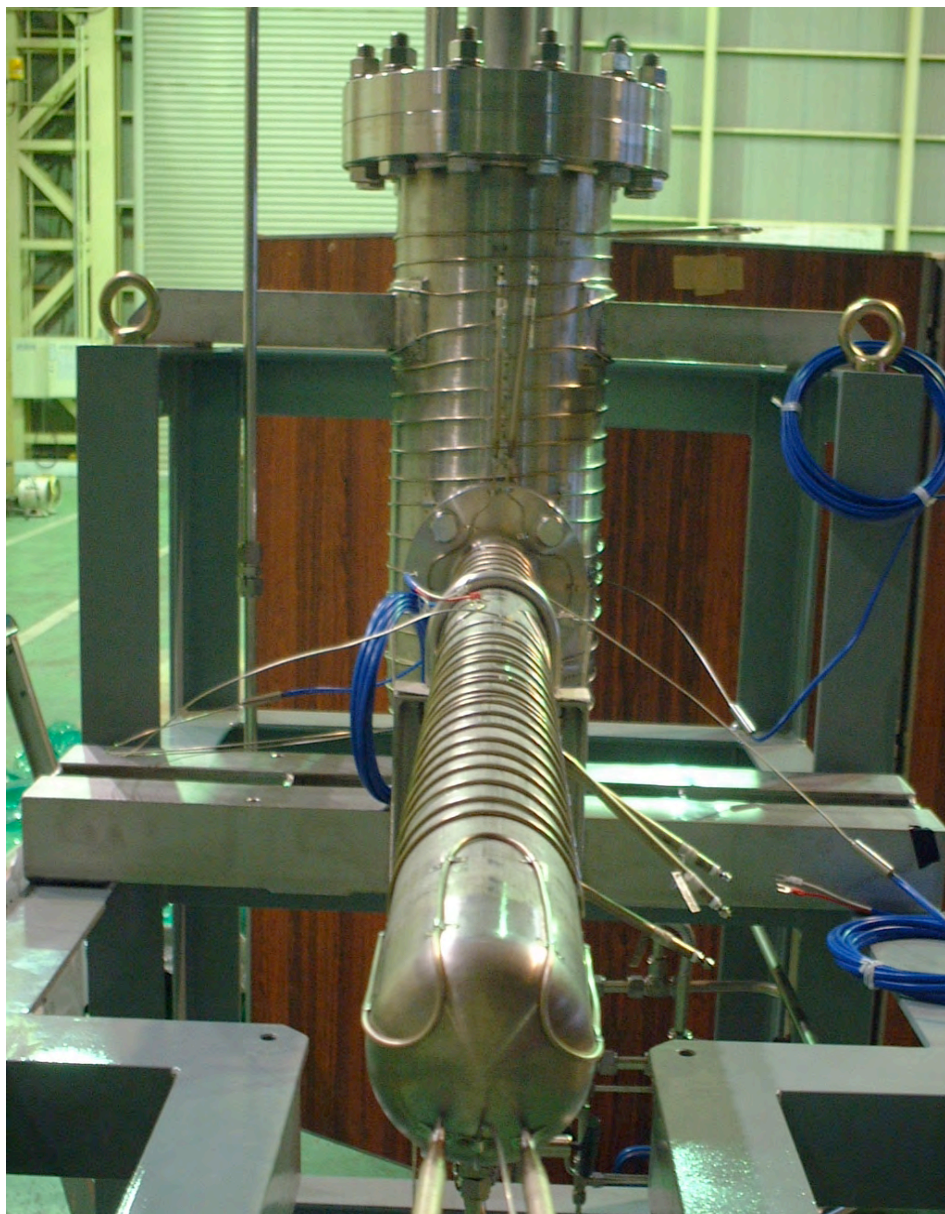
JLBL-1

10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008



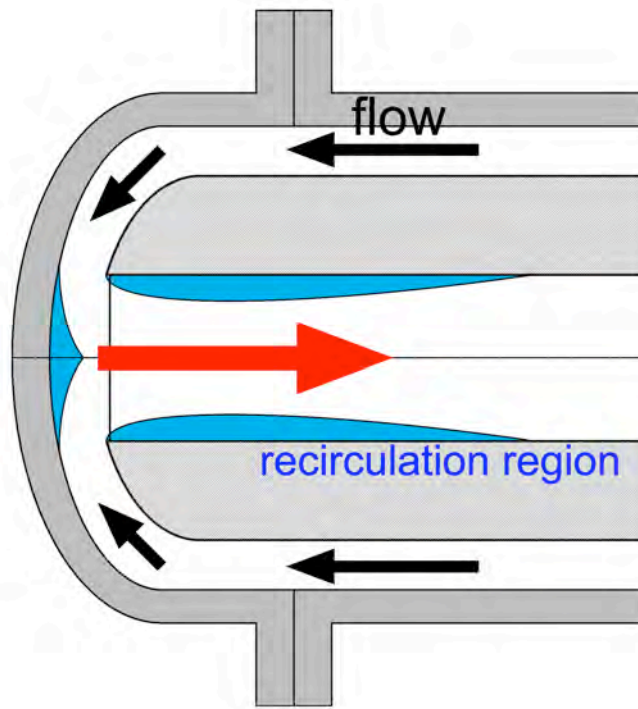
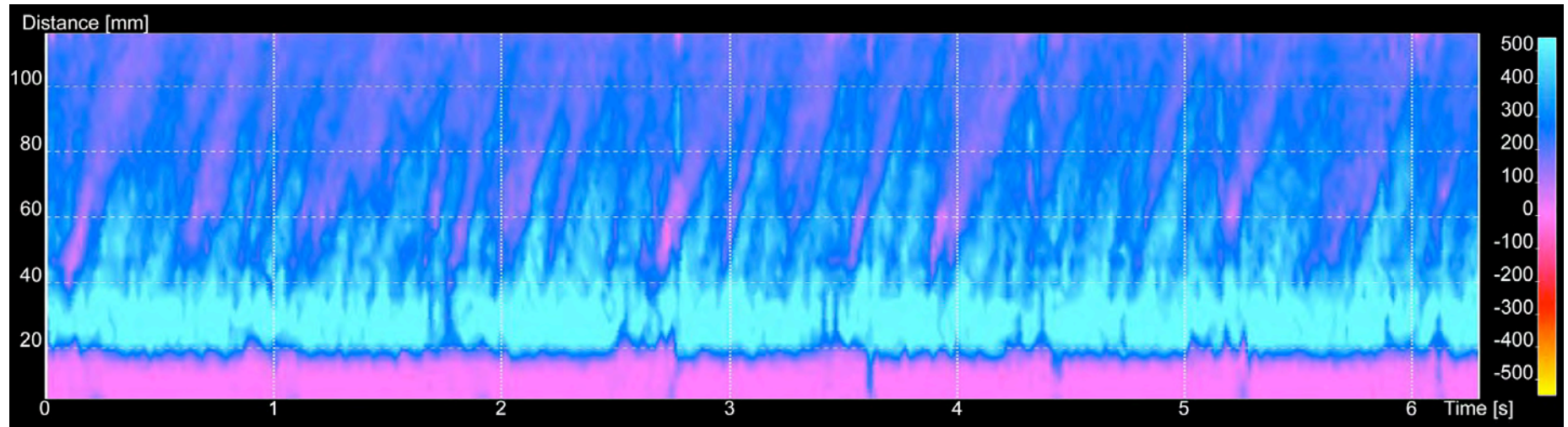


# JLBL-2



10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008

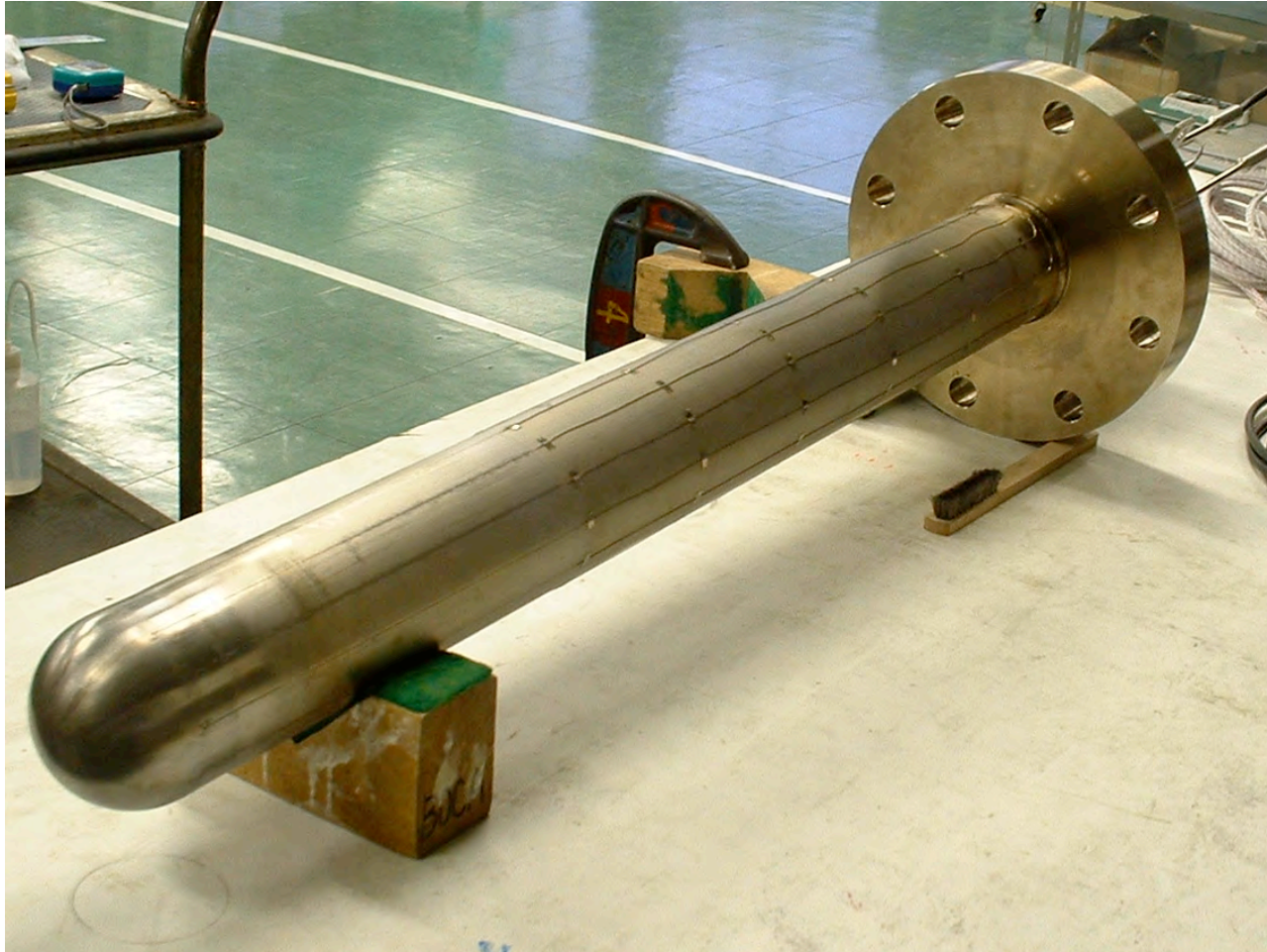




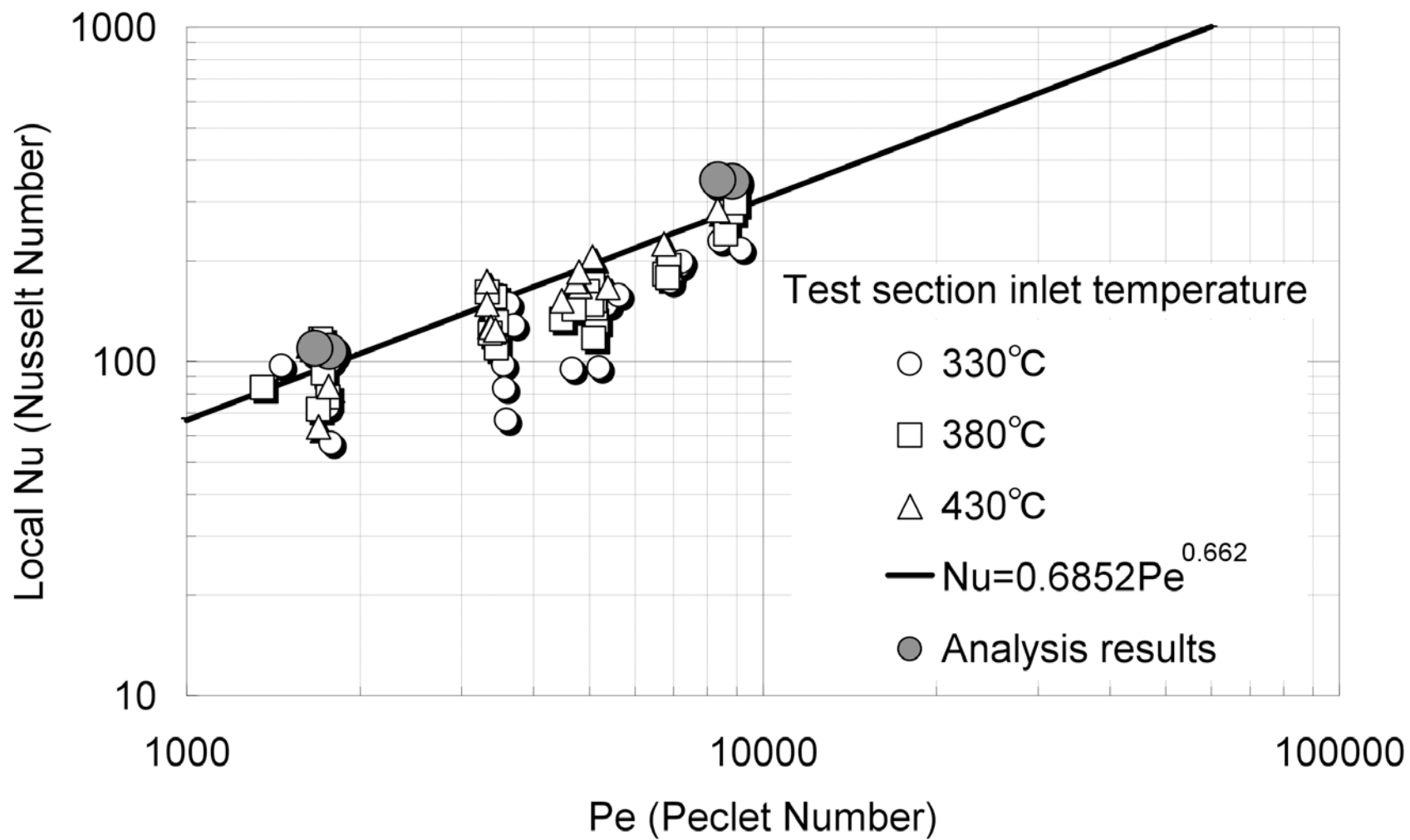
JLBL-3



10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008



10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008



K HAYASHI, et. al, AESJ, 7-1, 2008,P44-57.

10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008

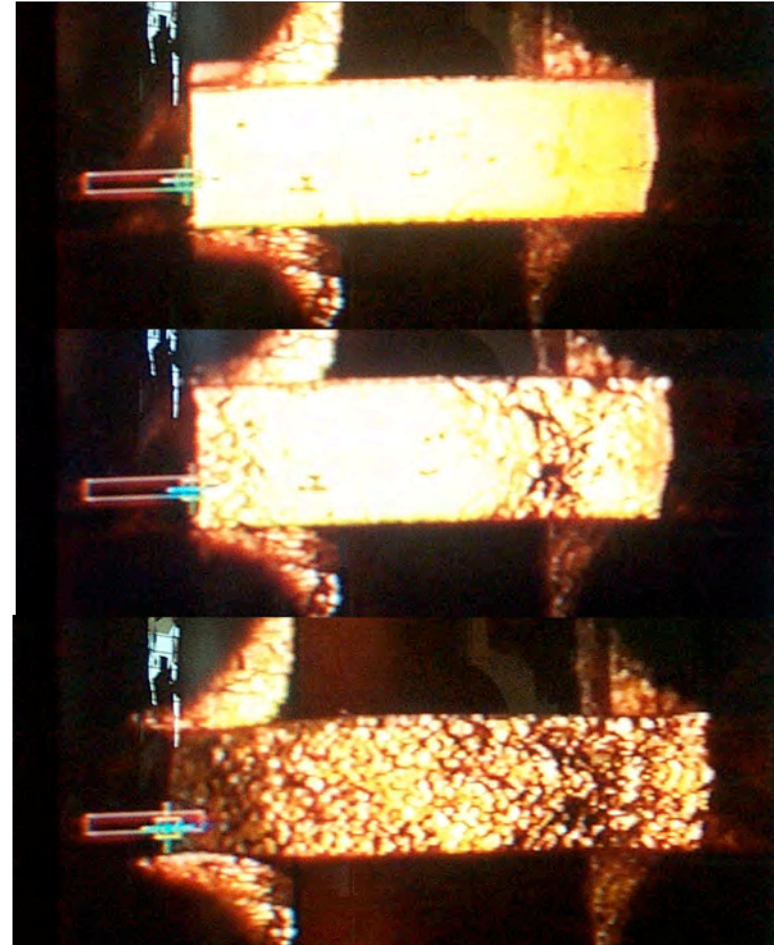
# STIP



10<sup>th</sup> OECD NEA Meeting on AFPP and T, Mito, 2008



RT



250°C

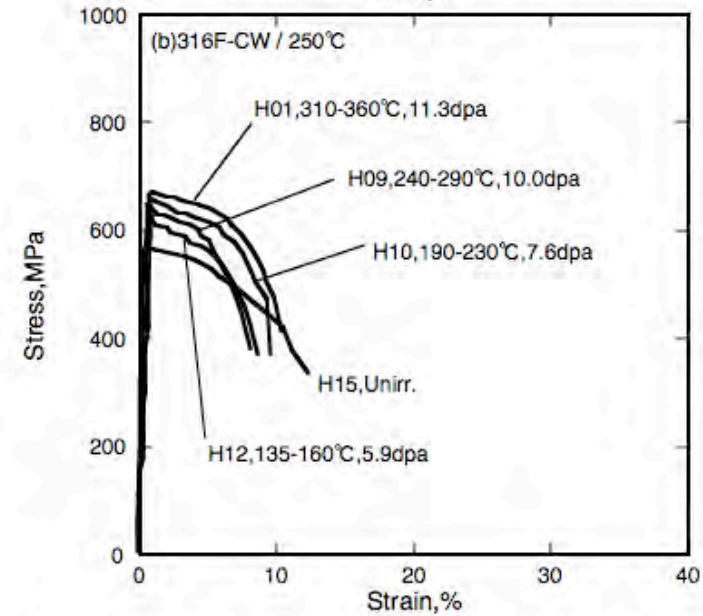
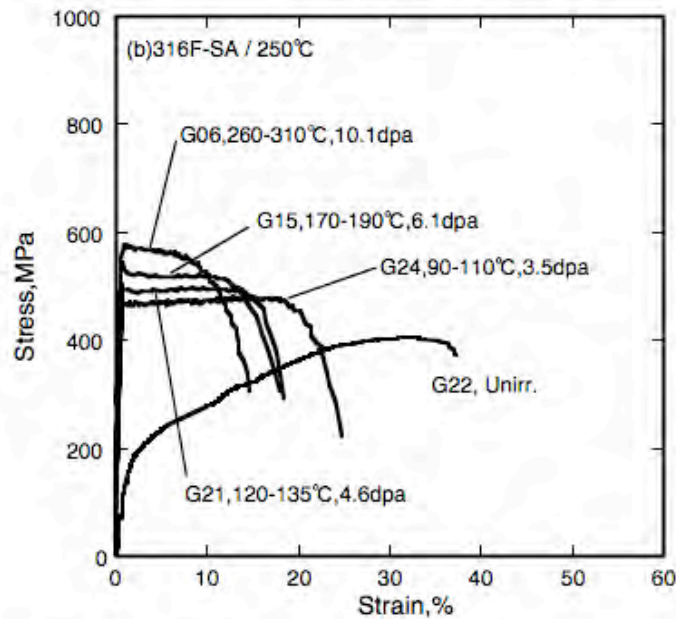
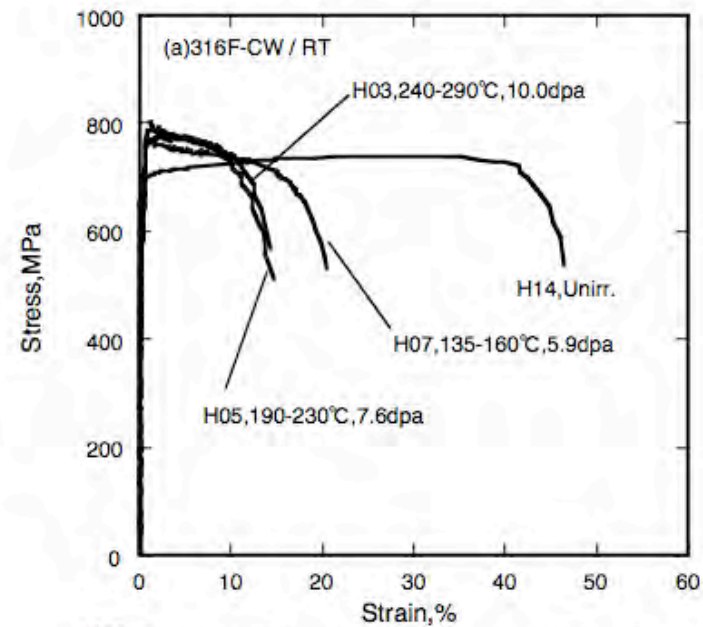
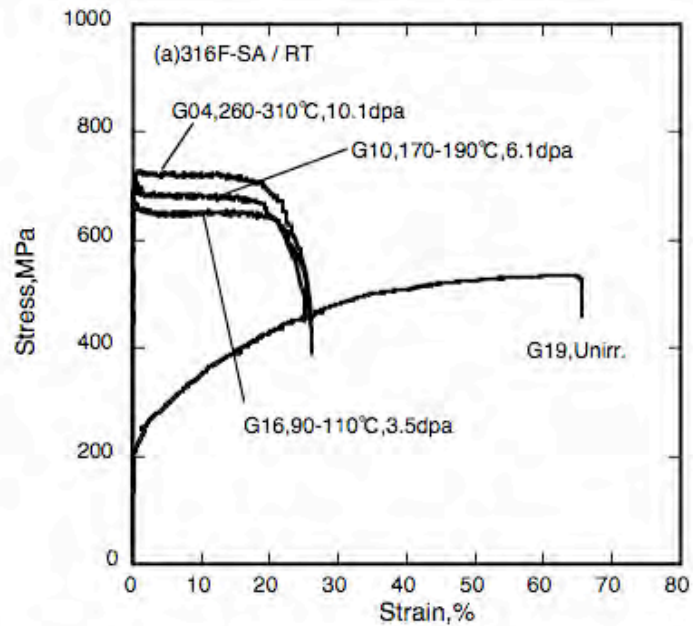
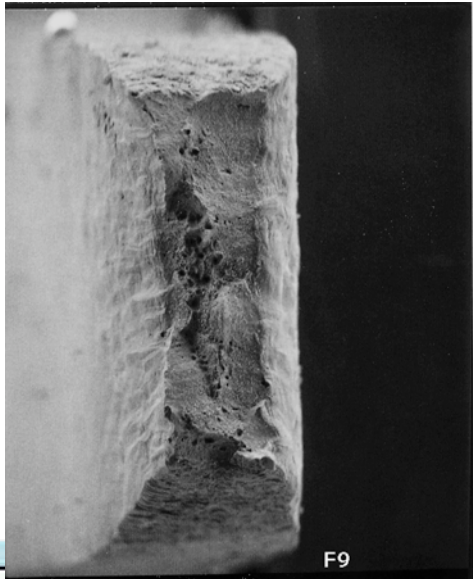
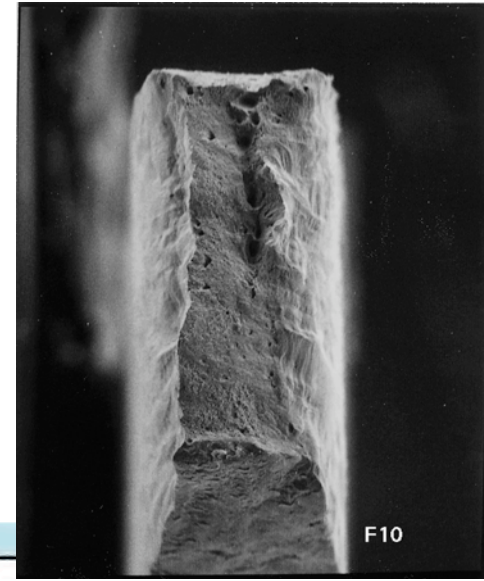
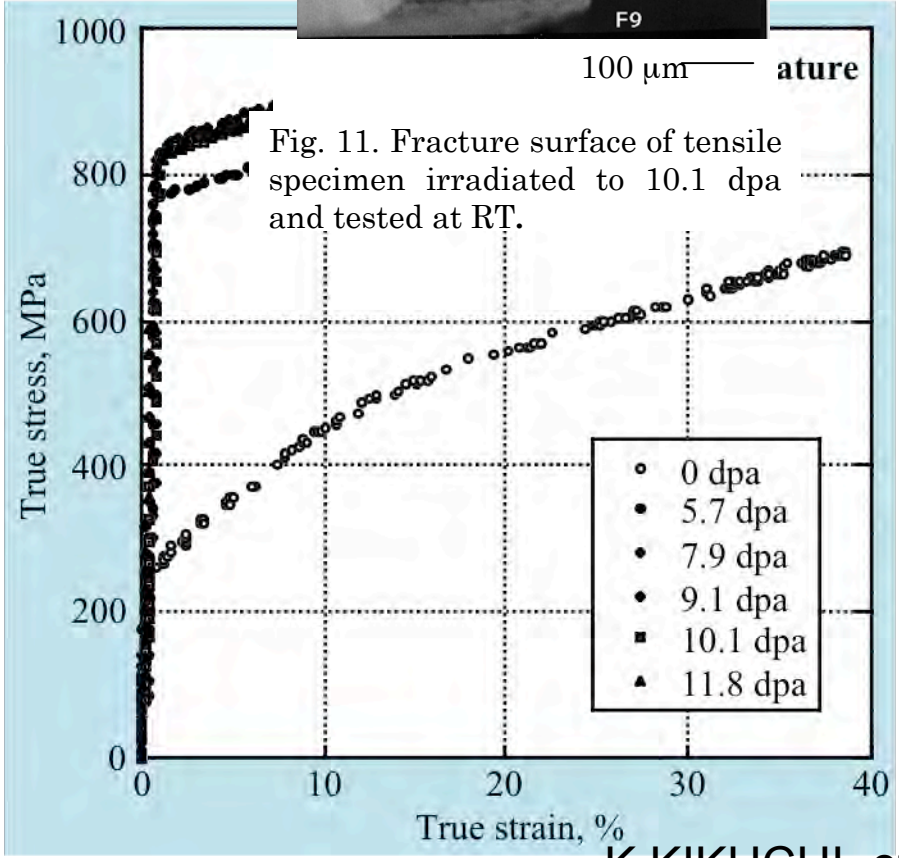


Fig. 2 Stress strain curves of the unirradiated and the irradiated 316F-SA tested at (a)RT and (b) 250°C.

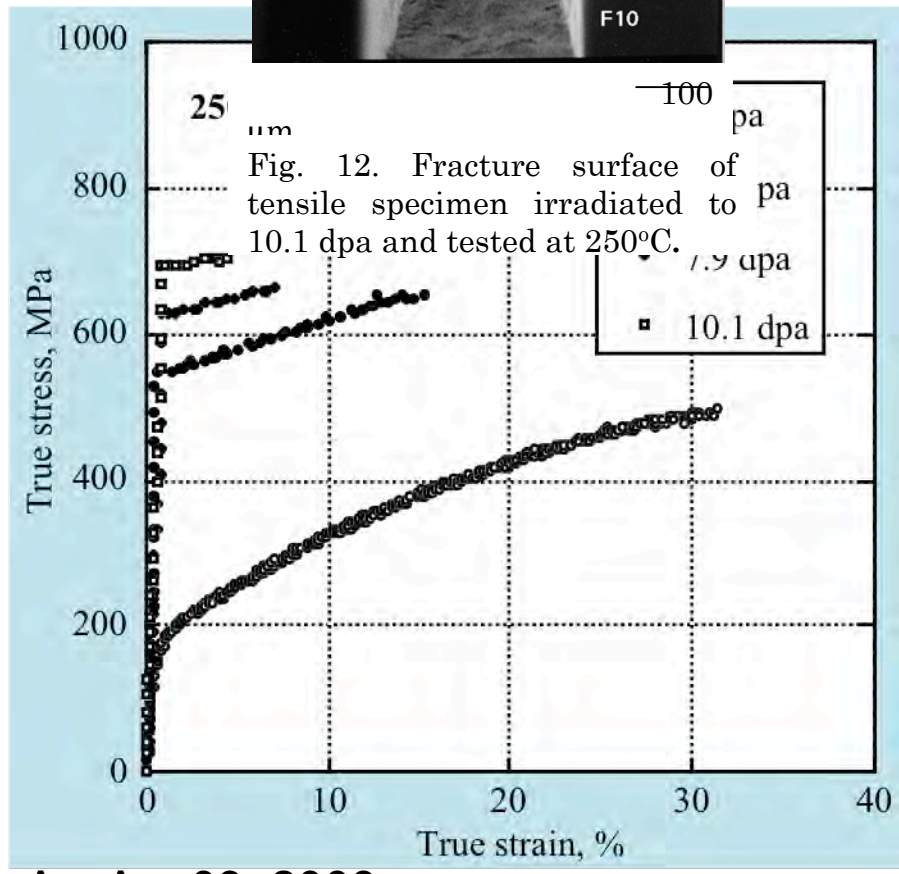
Fig. 6 Stress strain curves of the unirradiated and the irradiated 316F-CW tested at (a)RT and (b) 250°C.



F9

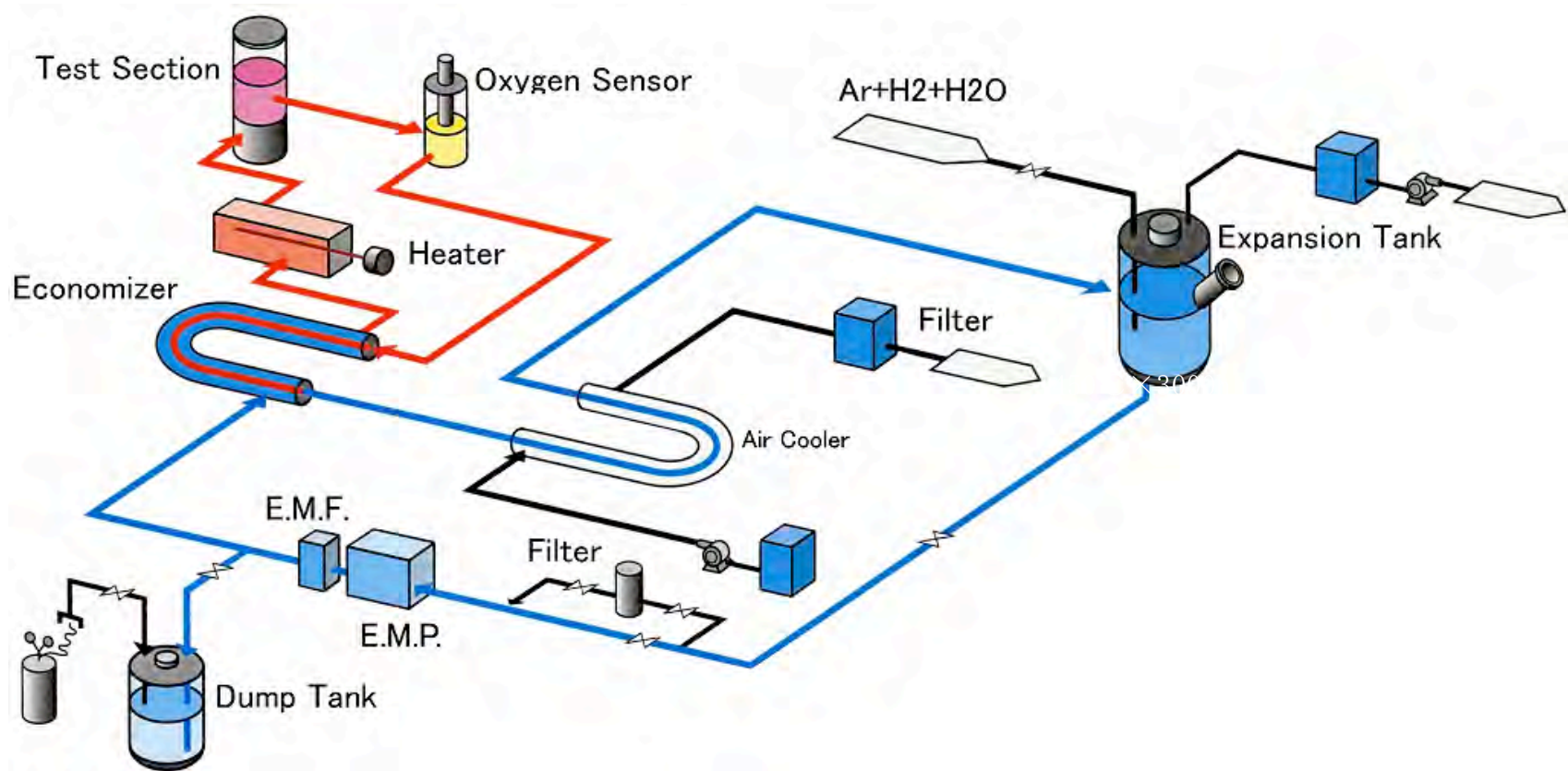


F10





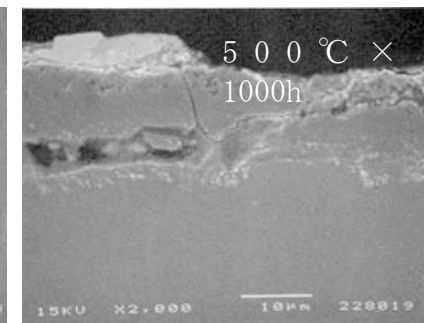
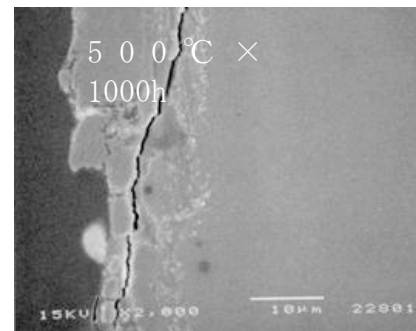
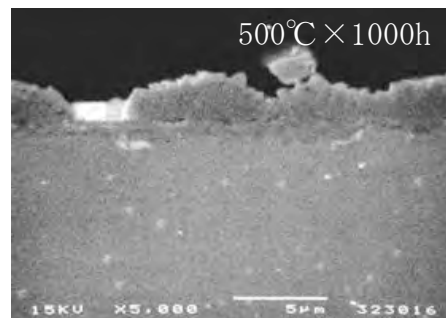
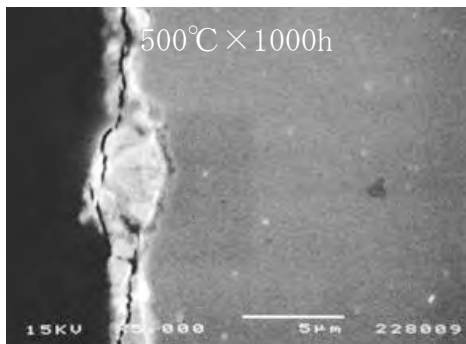
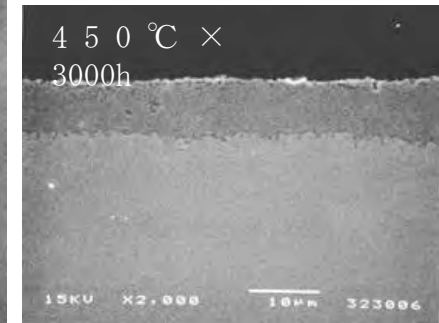
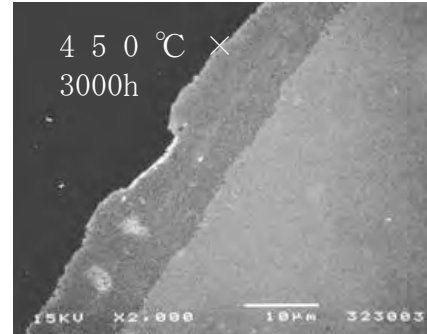
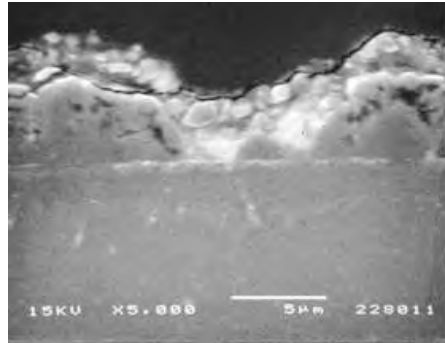
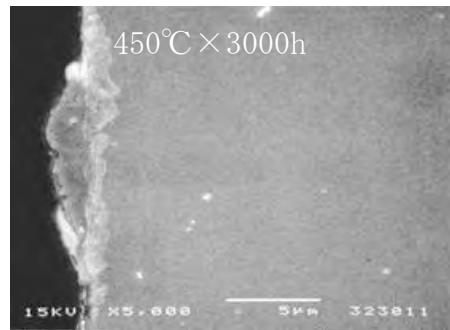
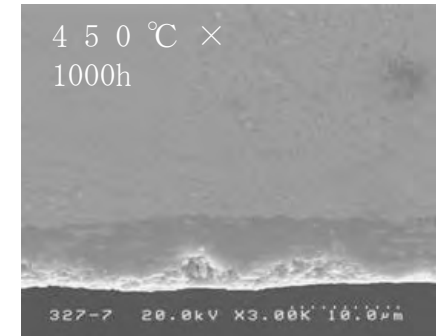
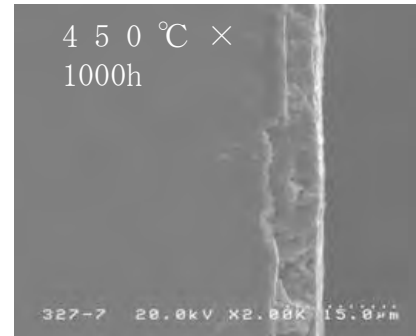
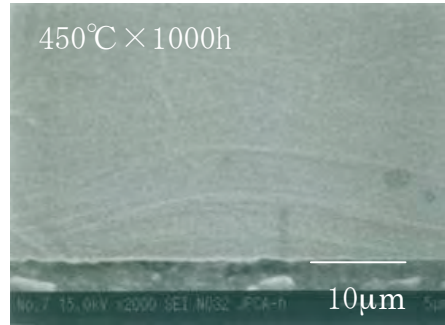
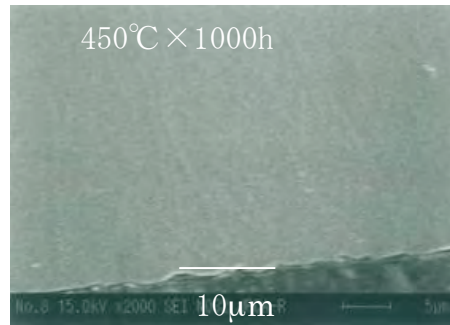
# Corrosion in another loop



MES lead bismuth forced corculation loop system flow

### JPCA<450C

### F82H<500C



K KIKUCHI, et. al, JNM, 377, 2008,P232-242

# Achievements of our Practice

- Proton irradiation  
Data base for austenitic steel have been obtained up to 20 dpa, which included mechanical property and micro-nano structure.
- JLBL-1  
Materials property under LBE flow was obtained through 18000 hrs run.  
Oxygen sensor property and performance of EMP were investigated.
- JLBL-2  
EMP drove LBE in the coaxial counter flows. EMP performance was investigated. Ultrasonic Doppler probe visualized LBE flow.
- JLBL-3  
Massive flow control was experienced (500L/min). Heat transfer coefficient of the beam model was formulized.