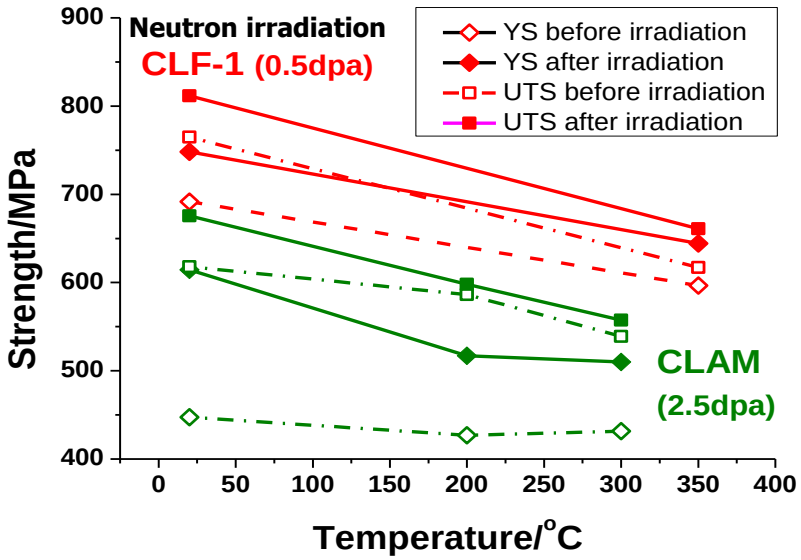
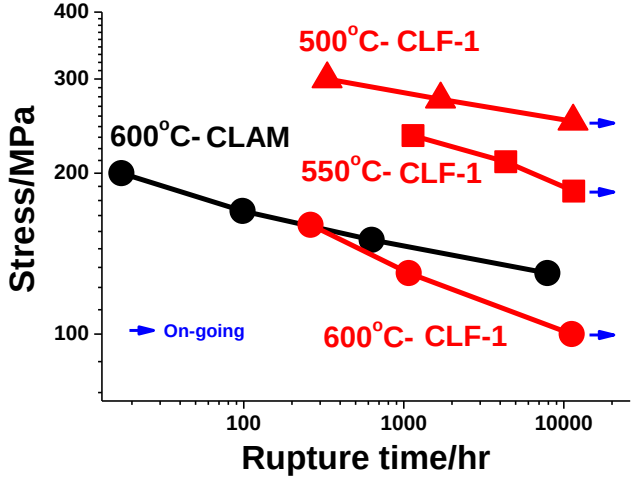
1. RAFM and ODS steels for ITER TBM and China DEMO

CLF-1: Fe8.5Cr1.5W0.25V0.1Ta0.5Mn0.1C
CLAM: Fe9Cr1.5W0.2V0.15Ta0.45Mn0.1C



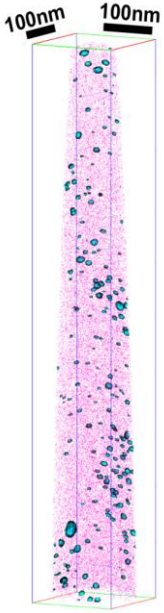
RAFM STEELS, *(SWIP, INEST)*

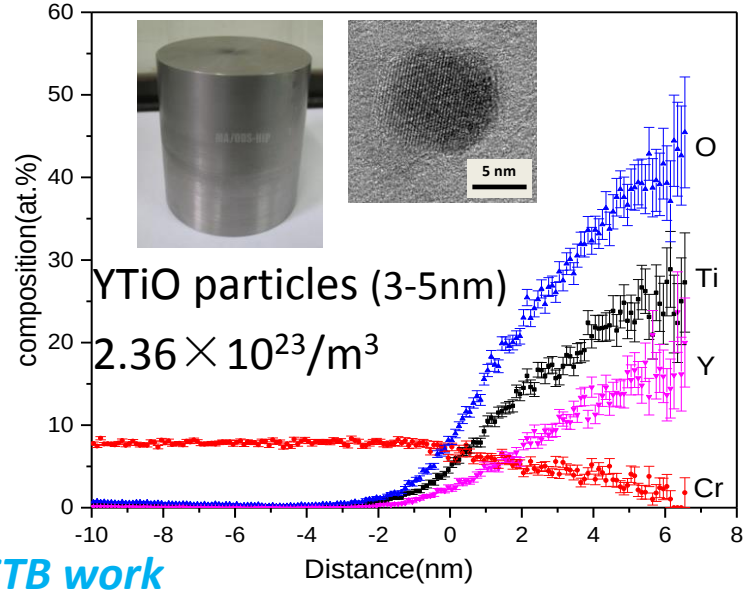
ODS-RAFM *(USTB etc.)*



➢ Two kinds of RAFM steel (CLF-1, CLAM) are developed for ITER-TBM and DEMO reactor.

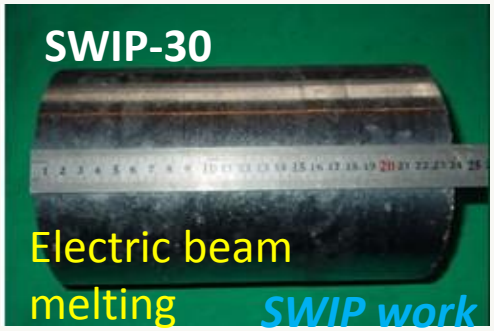
➢ 9Cr-ODS steel with fine nano-particles is developed





USTB work

2. Vanadium alloys for advanced blanket



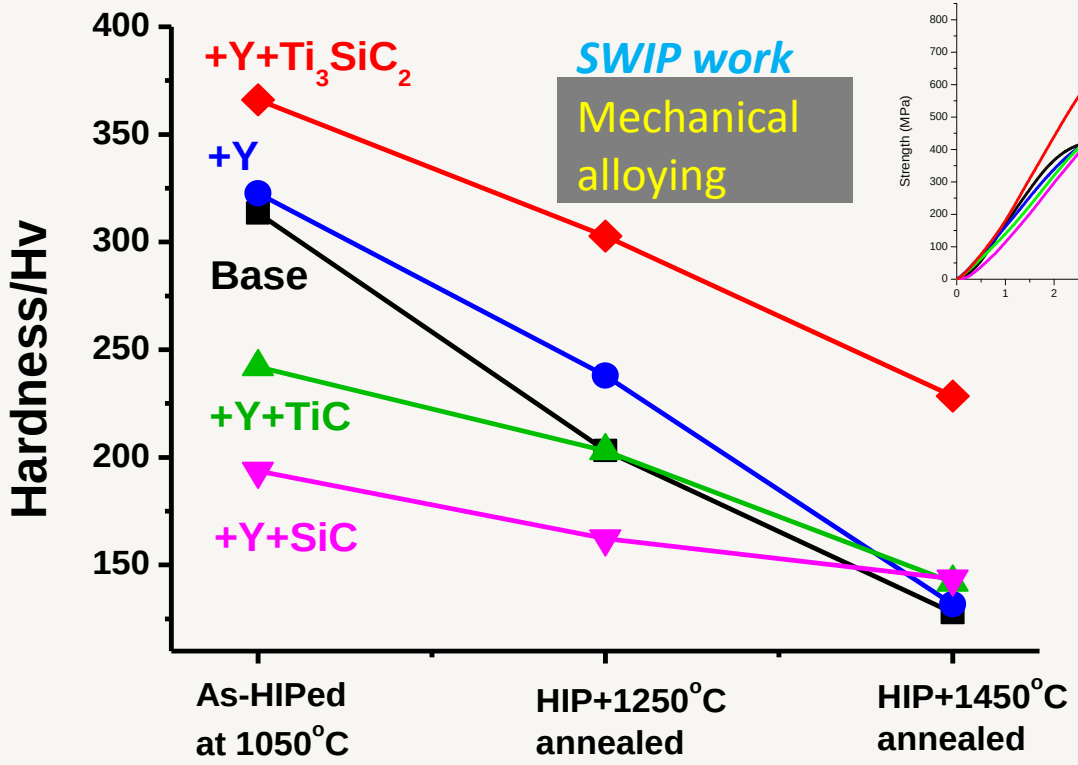
➢ **30kg V-4Cr-4Ti alloy was developed with high purity**

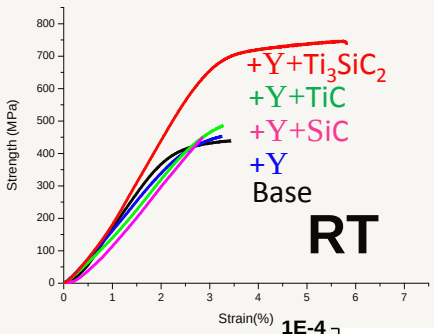
Cr (%)	Ti (%)	C (%)	N (%)	O (%)	S (%)
3.81	3.92	**0.013**	**0.002**	**0.027**	0.002
Al (%)	Si (%)	K (%)	Fe (%)	Mg (%)	Ca (%)
0.01	0.059	0.005	0.0053	0.0022	0.0067

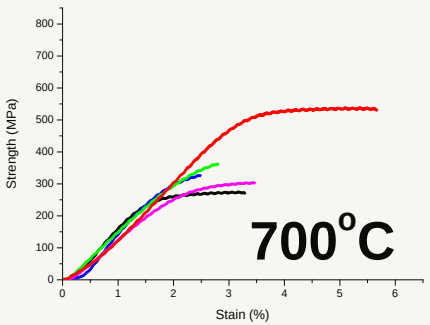
VANADIUM ALLOYS

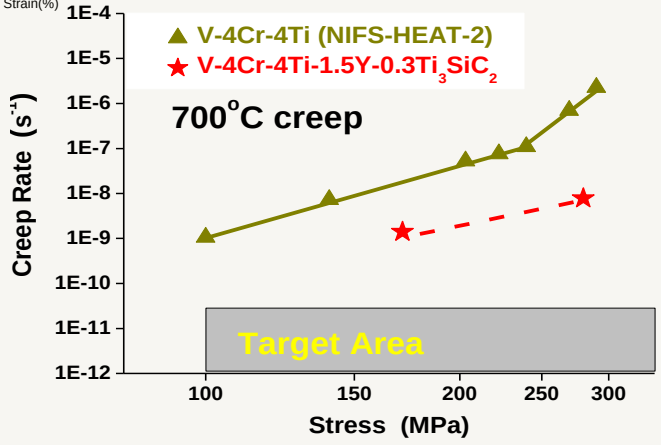
(SWIP)

➢ **Carbide dispersion strengthened V-alloys are developed. Ti_3SiC_2 is found to strengthen the V-alloy most efficiently, for both RT and high temperatures .**



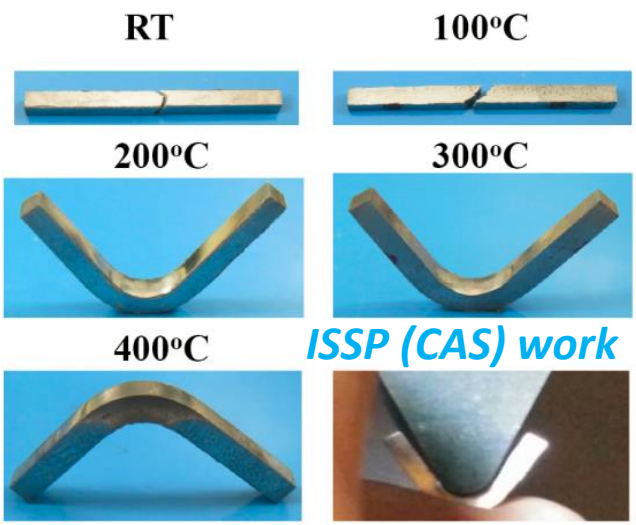


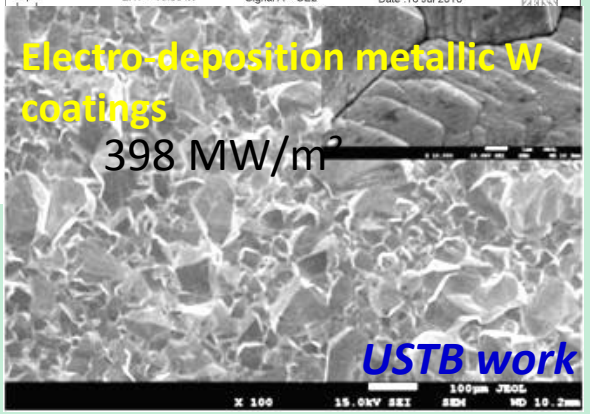




3. Tungsten alloys/coatings and divertor mock-up development

➢ ODS W-alloy and W coating were developed





ODS W-ALLOYS ***(ISSP, USTB)***

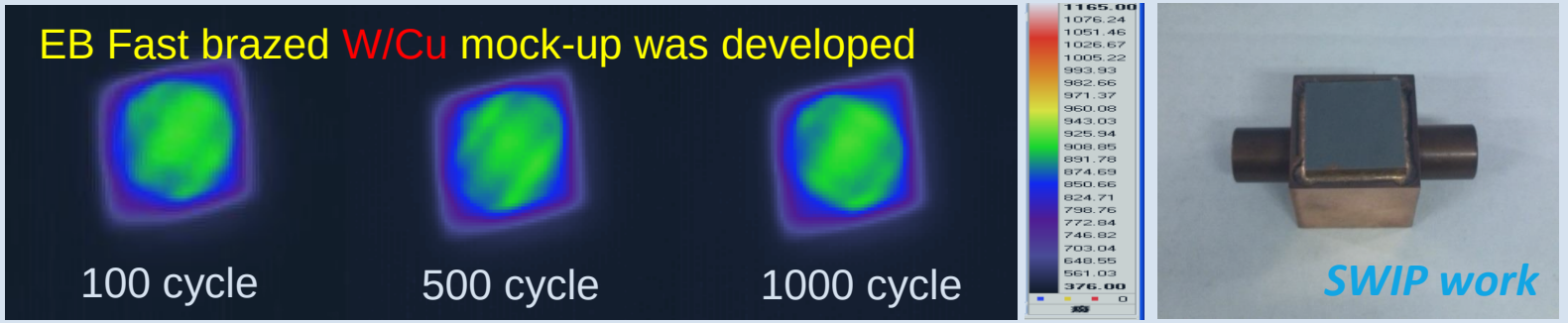
W COATING ***(XTC, USTB)***

W MOCKUP ***(SWIP, XTC)***

➢CVD W/graphite and W/Cu mock-ups were developed and tested under high heat flux.

1000 cycles, 10MW/m² HHFT,

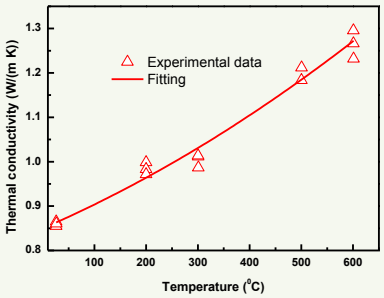
No failure

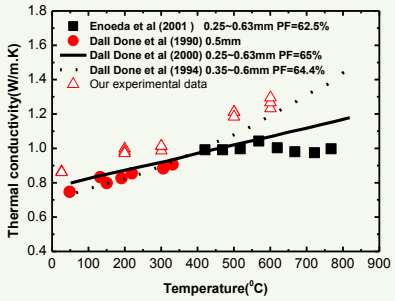


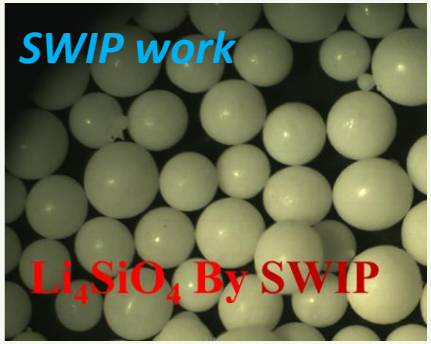
4. Functional materials for ITER-TBM

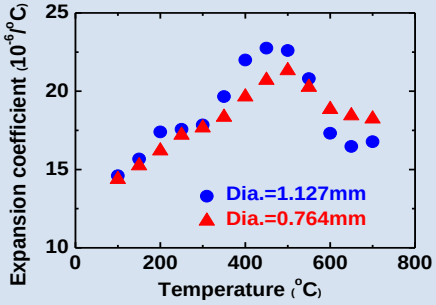
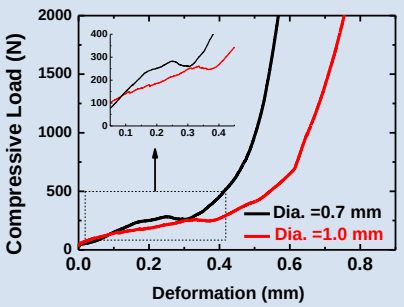
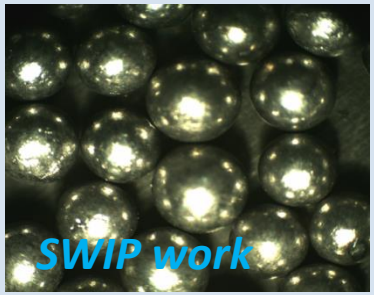
TRITIUM MULTIPLIER *(SWIP)*

NEUTRON BREEDER *(SWIP)*







➢ Developed Li_4SiO_4 tritium breeder and neutron multiplier pebbles for ITER-TBM.

➢ Tested their thermal-mechanical properties