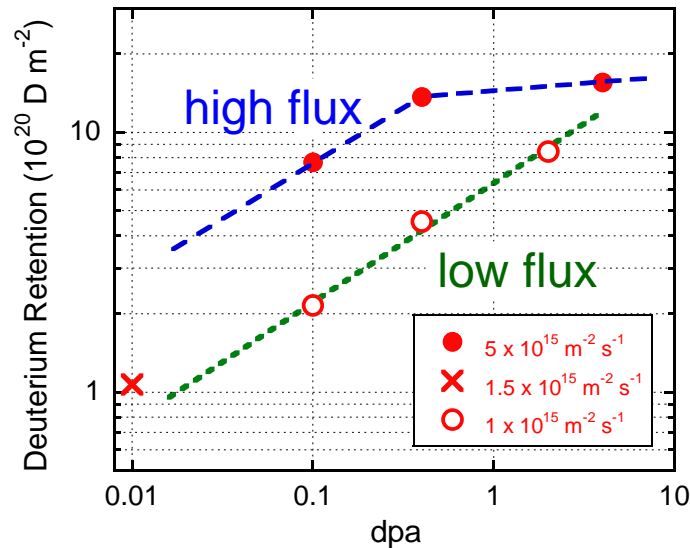


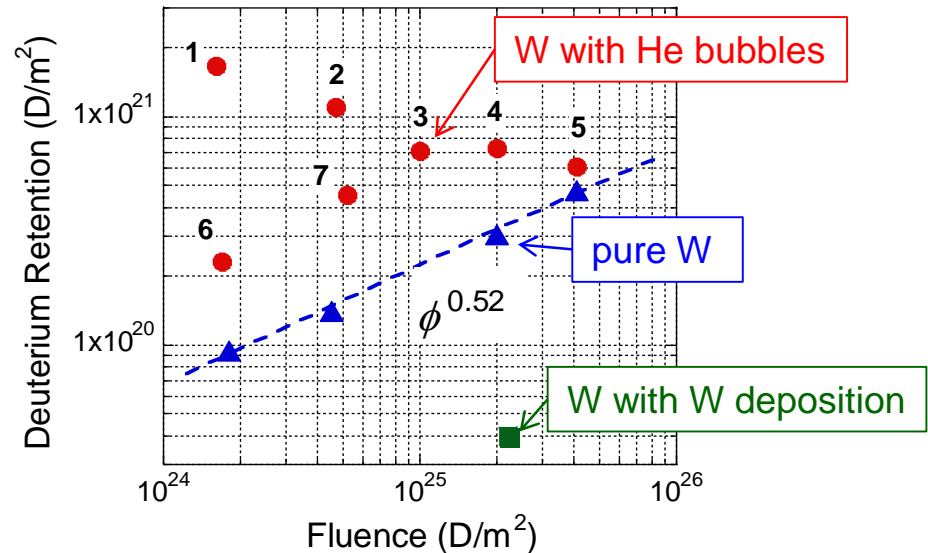
# Hydrogen Isotope Retention in Tungsten Surface-modified by Heavy Ion Irradiation, Helium bubbles and Tungsten Deposition

- Enhancement of hydrogen isotope retention in W due to neutron irradiation is a critical concern for safety hazards as well as particle control.
- Key issues are to understand properties of retention in damaged W and to reduce the retention.



*D retention in W samples irradiated with 2.4 MeV  $\text{Cu}^{2+}$  at different flux as a function of the damaged level.*

- D retention increases significantly with the damage level up to 0.4 dpa and then saturates for high flux irradiation.
- Defect formation depends on not only a damage level but also flux of the high energy ions.



*Fluence dependence of retention in pure, W with helium bubbles and W with a W deposited layer. The number next to the symbol indicates the order of the D plasma exposure.*

- He bubbles trap rather large amount of D atoms but simultaneously they generate a diffusion path for desorption of the mobile D atoms.
- A possibility of a W deposited layer as diffusion barrier has clearly been demonstrated for the first time.