

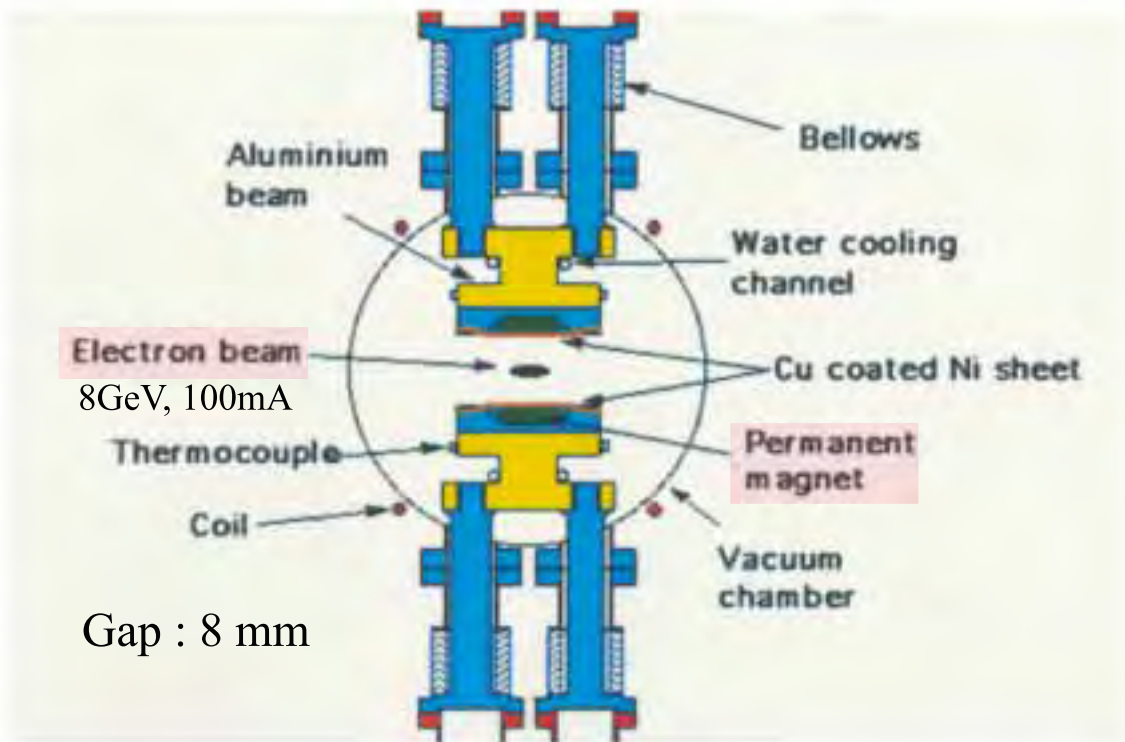
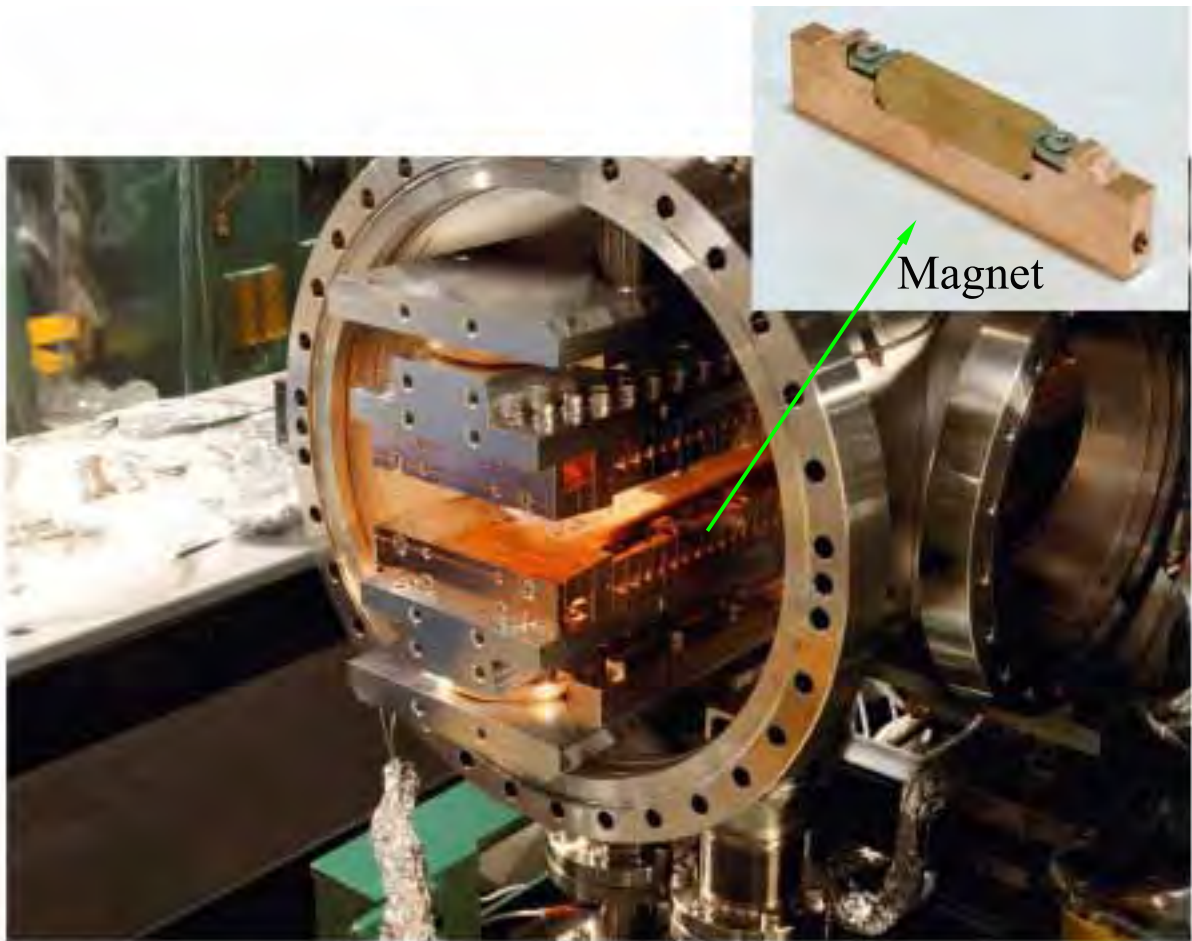
# **Demagnetization of undulator magnets irradiated high energy electrons**

Teruhiko BIZEN

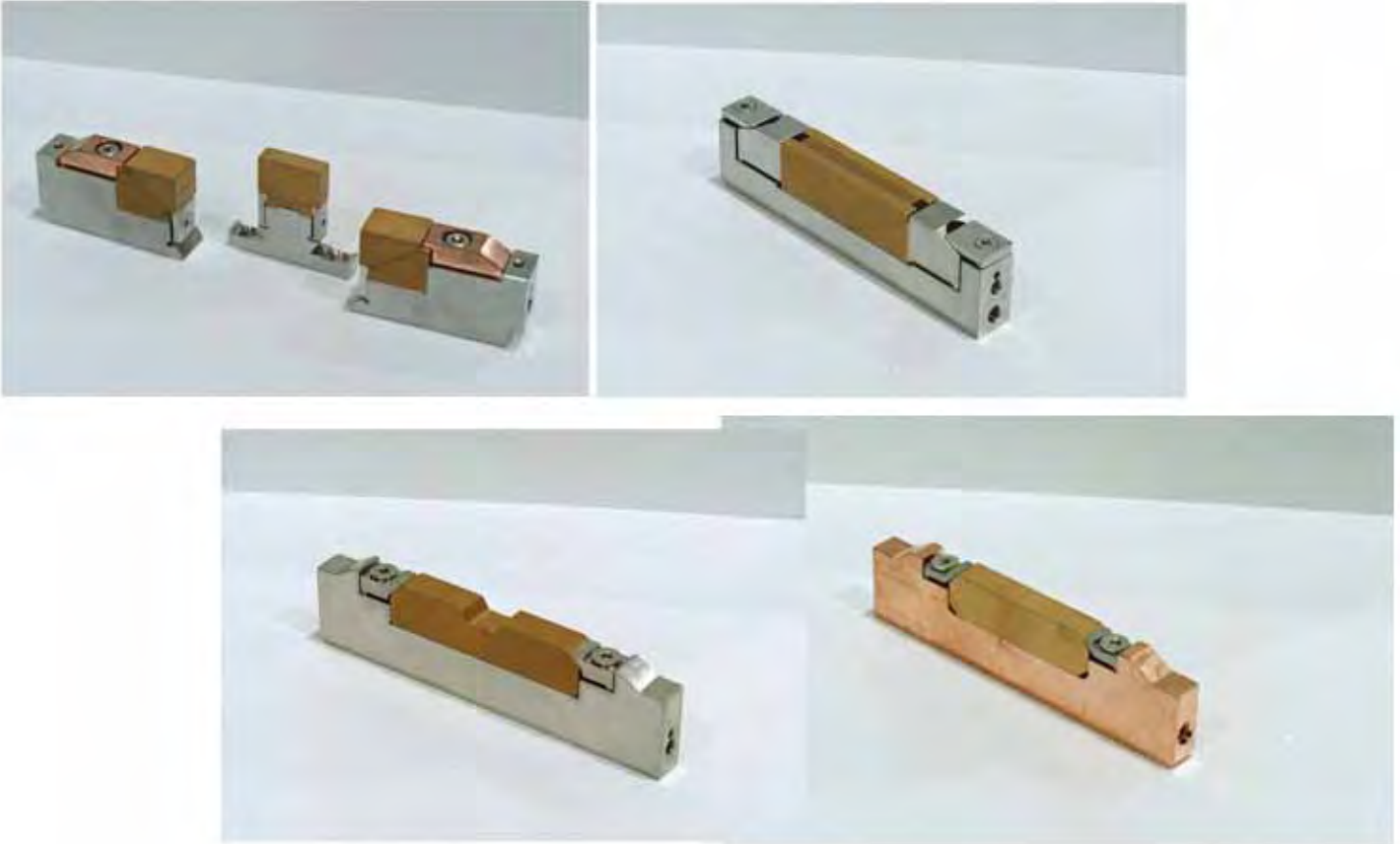
JASRI/SPring-8 Insertion device group

Collaborators

Y.Asano, H.Kitamura, T.Tanaka    **SPring-8**  
J.S.Bak, D.E.Kim, H.S.Lee        **Pohang Accelerator Laboratory**



In-vacuum undulator in SPring-8

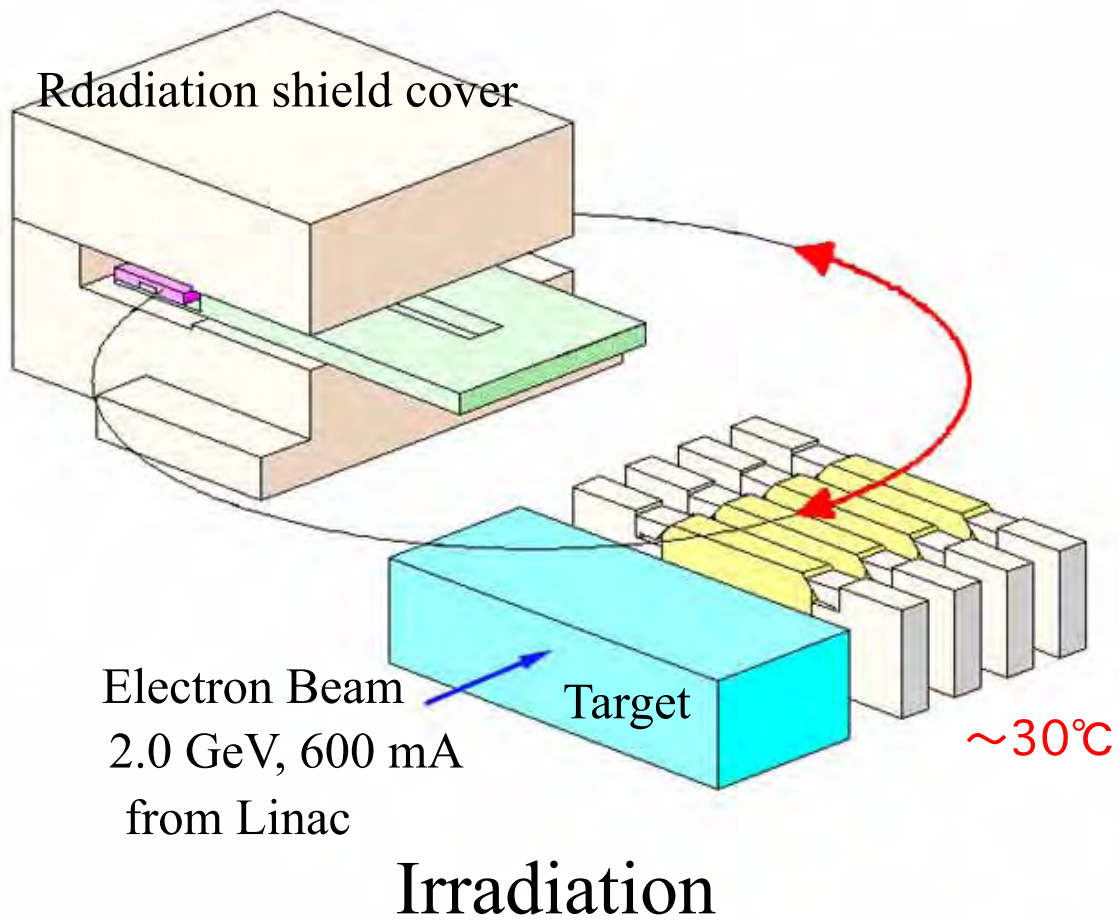
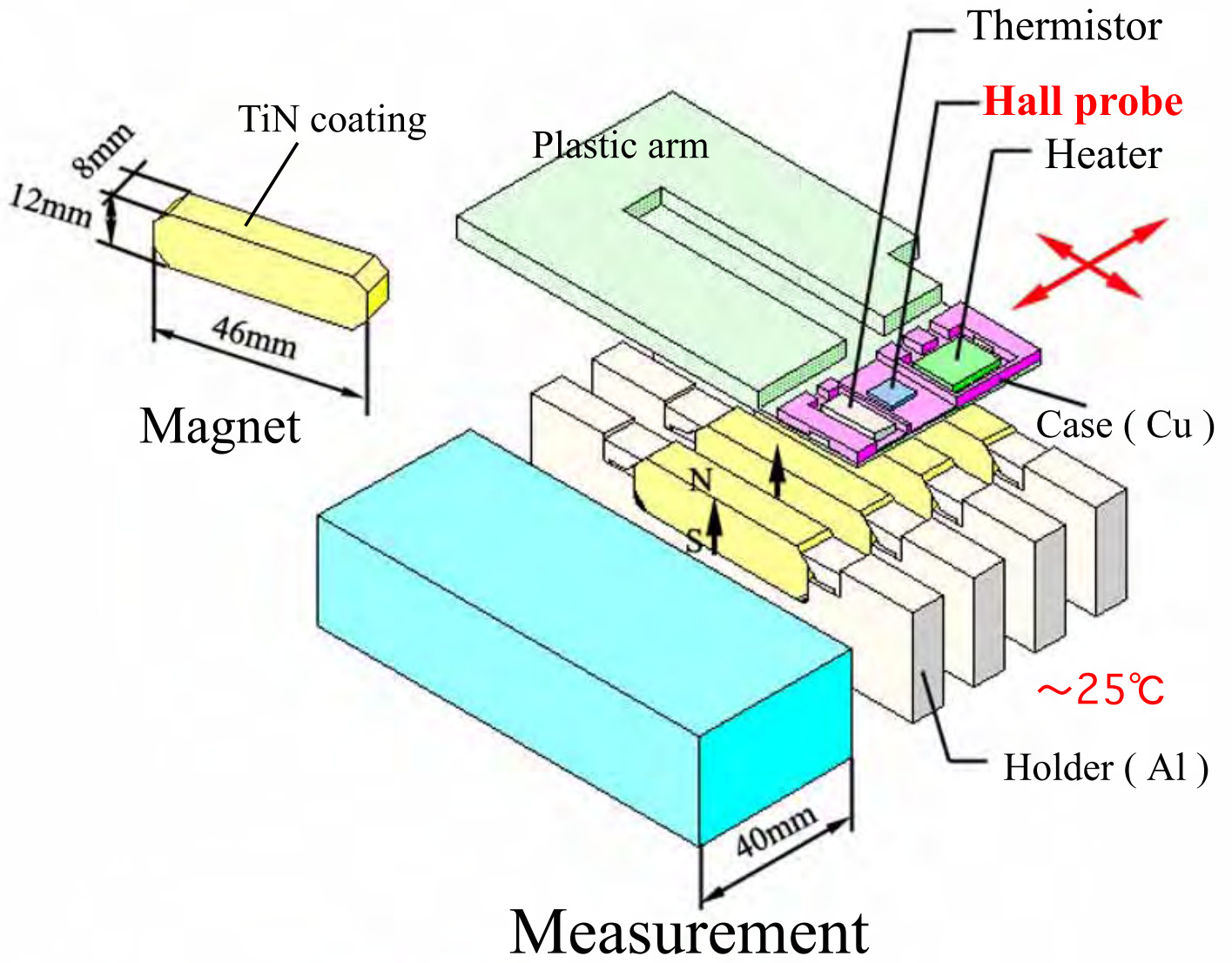


## Nd-Fe-B Magnets

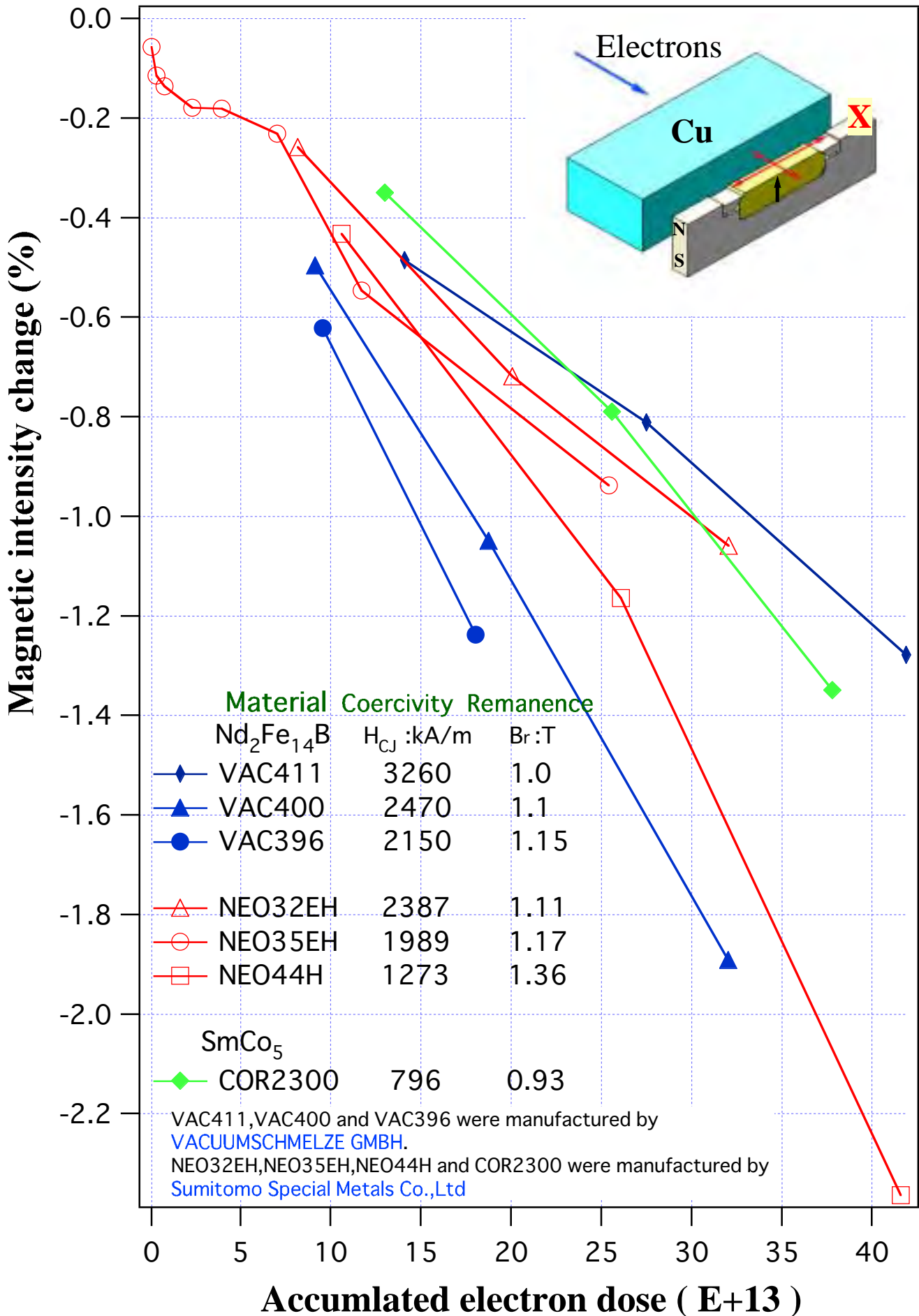
*Sensitive to radiation damage ?*

Effects of

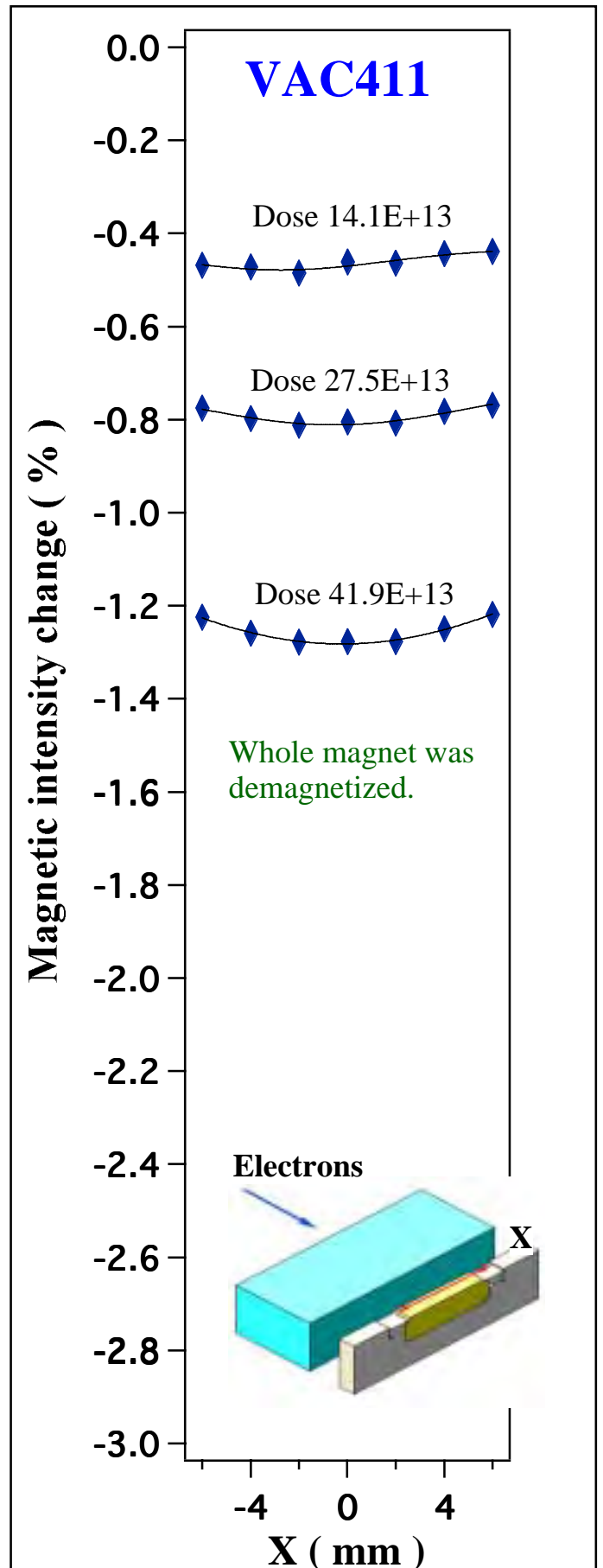
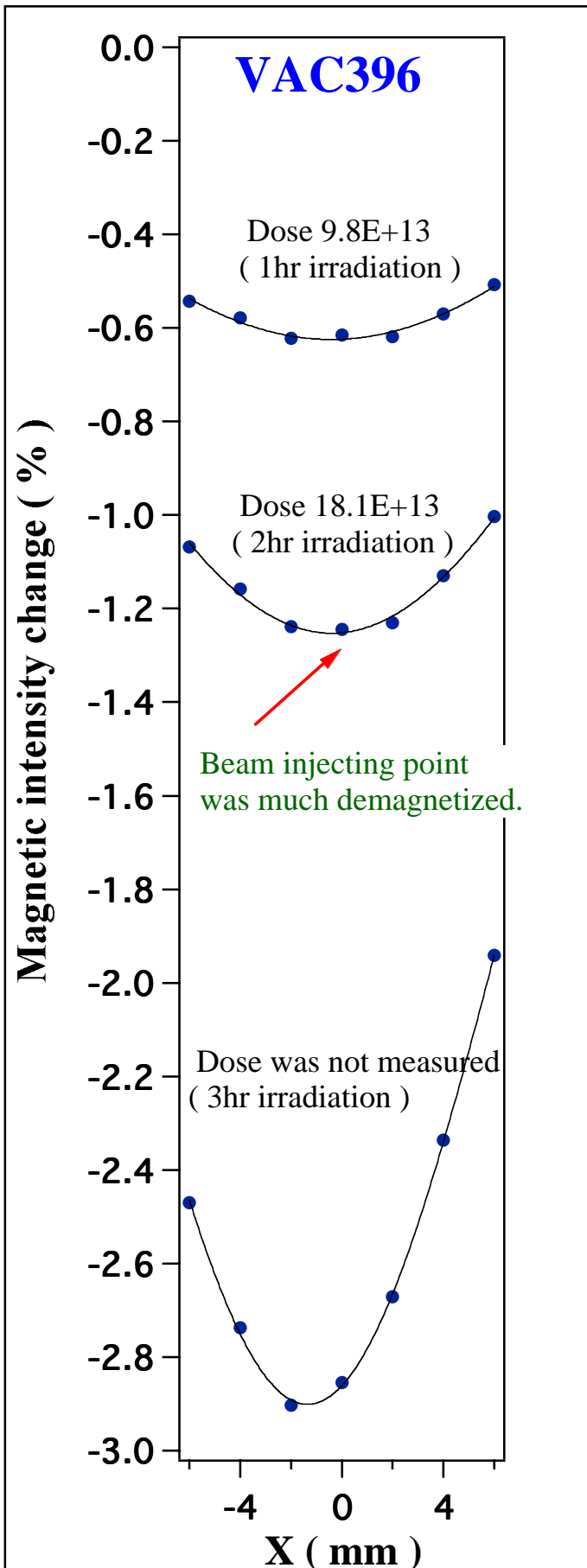
ambient conditions of magnets  
irradiated high energy electron



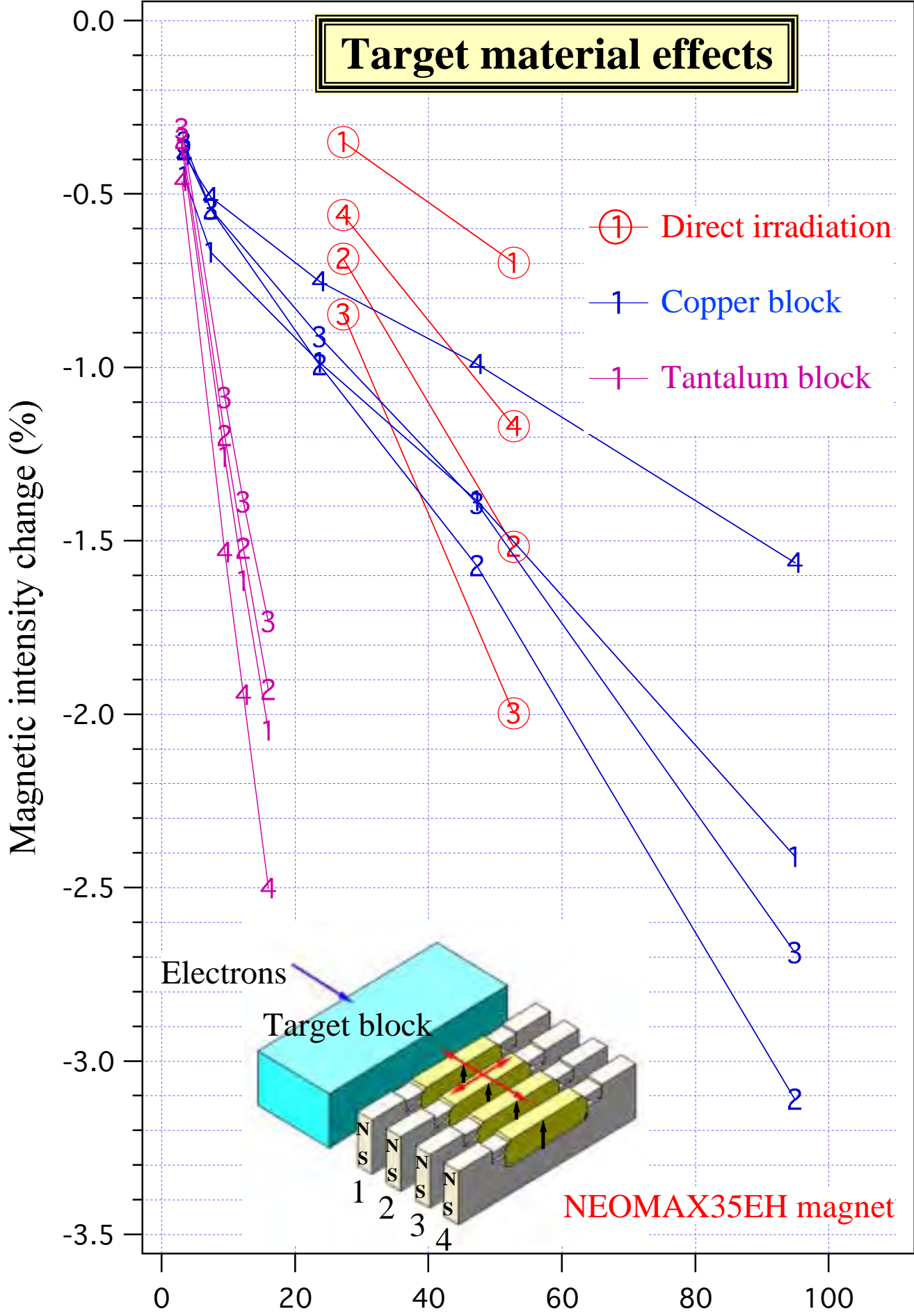
# Magnet materials and manufactures effects



# Magnetic field distribution change along the cross direction to the beam

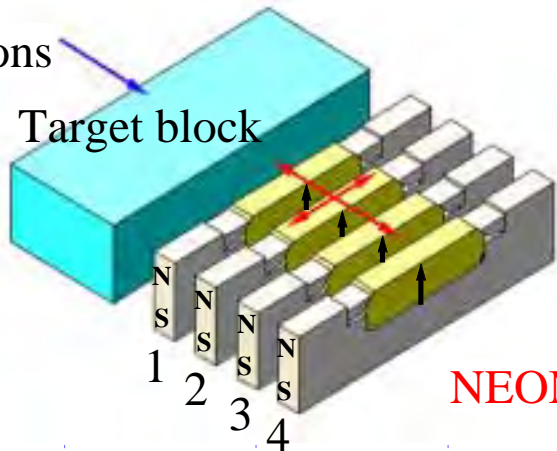


# Target material effects



Electrons

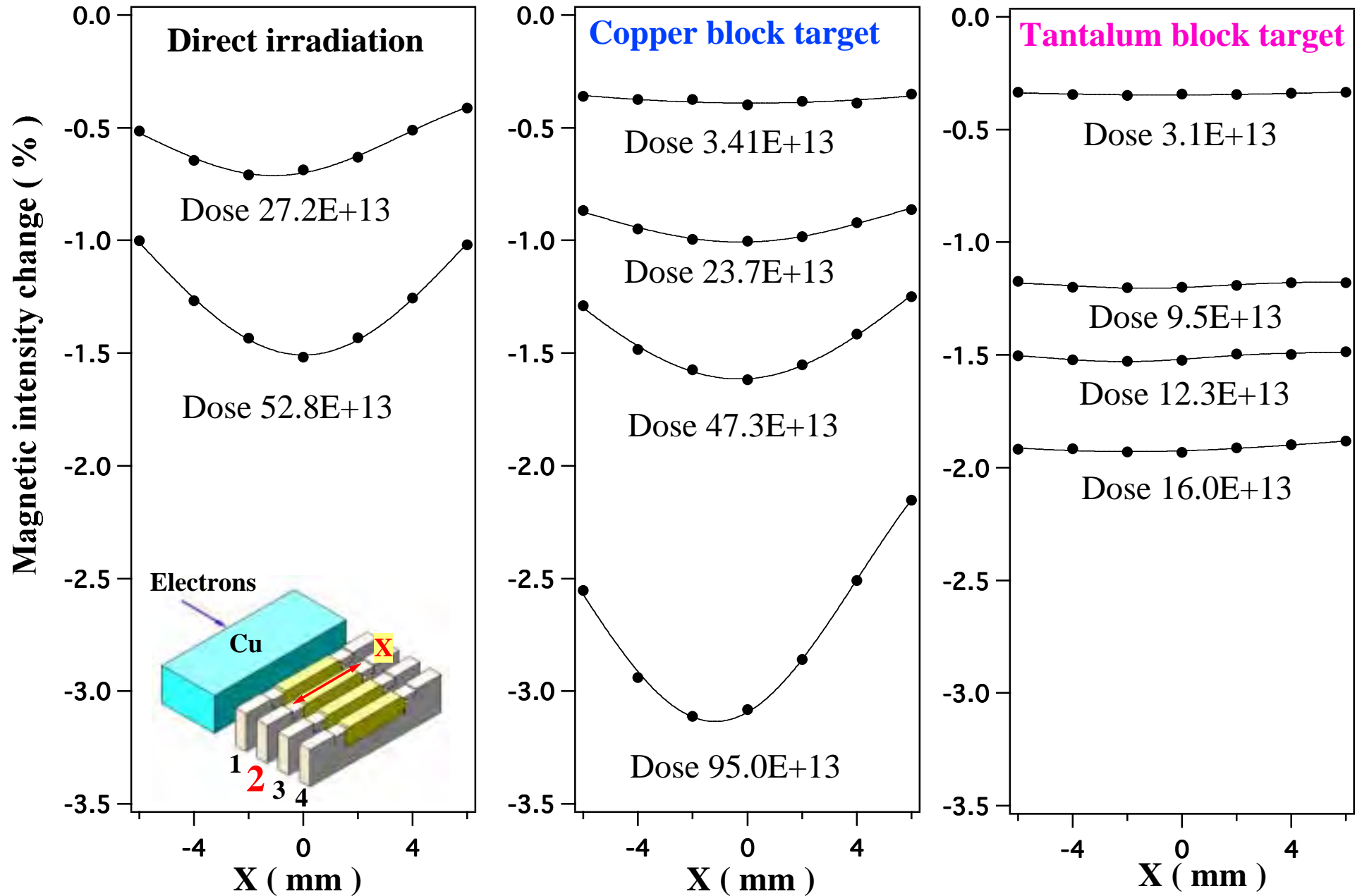
Target block



NEOMAX35EH magnet

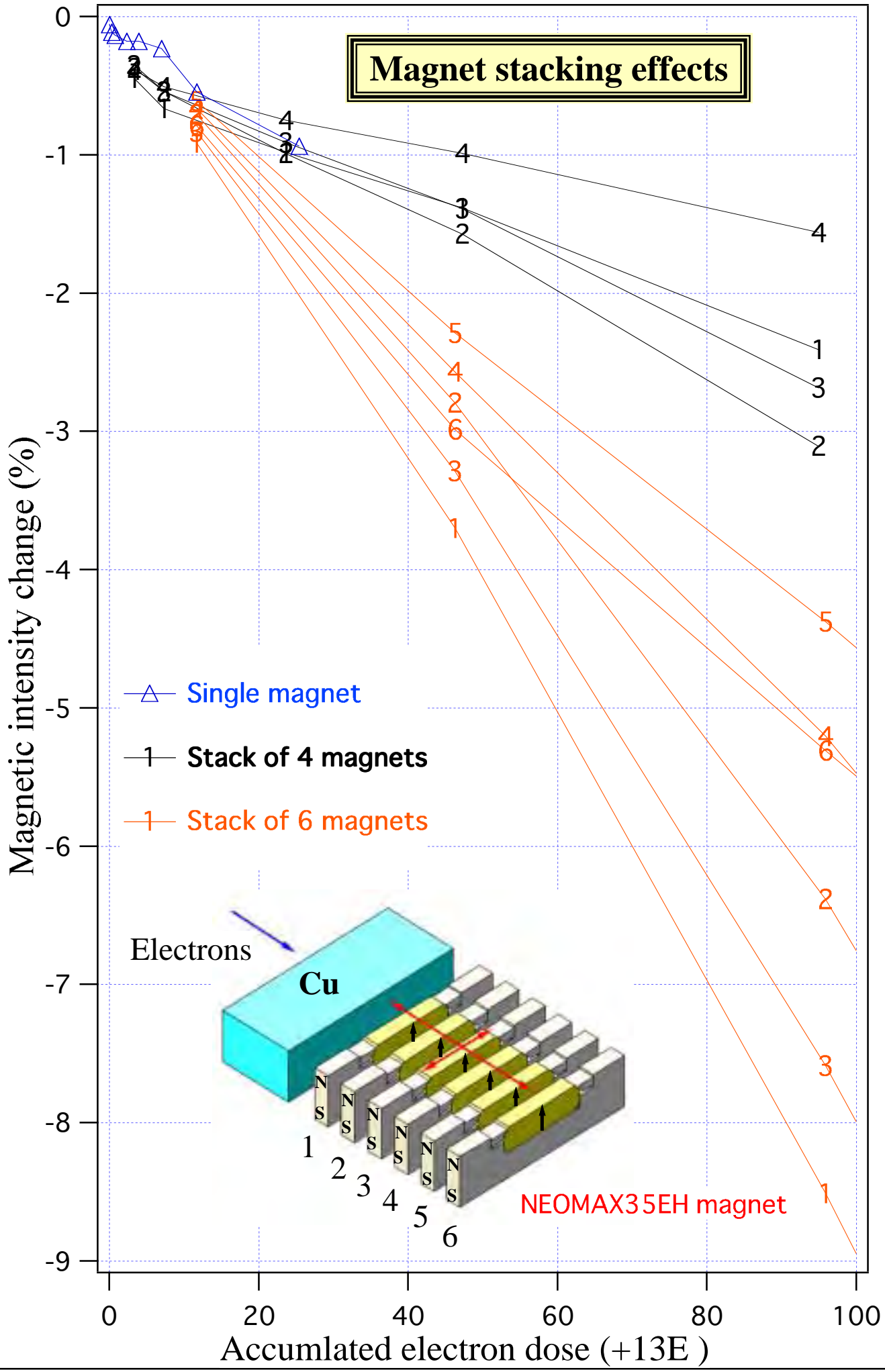
Accumulated electron dose (+13)

# Magnetic field distribution change on the 2nd magnet along the cross direction to the beam

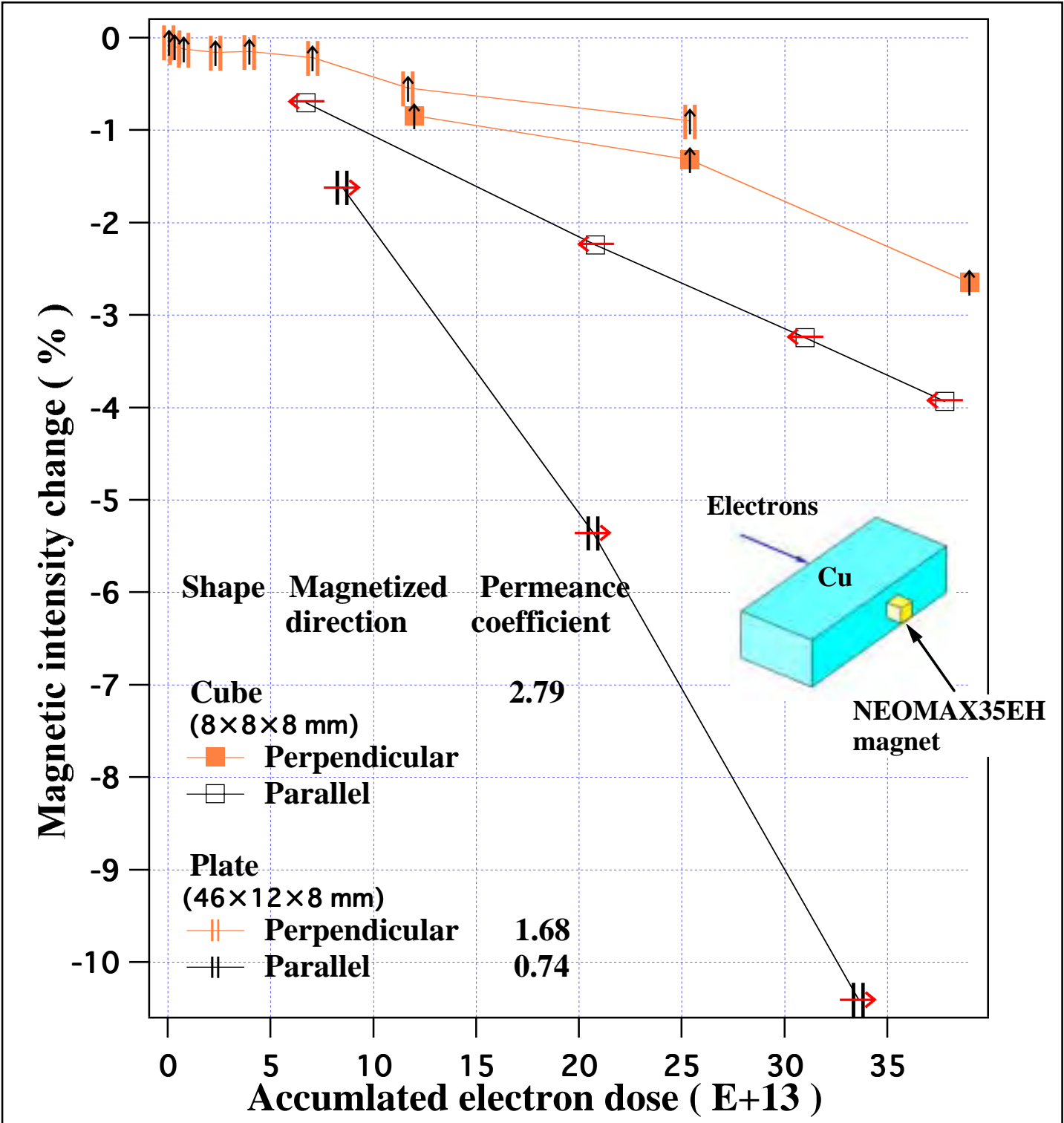




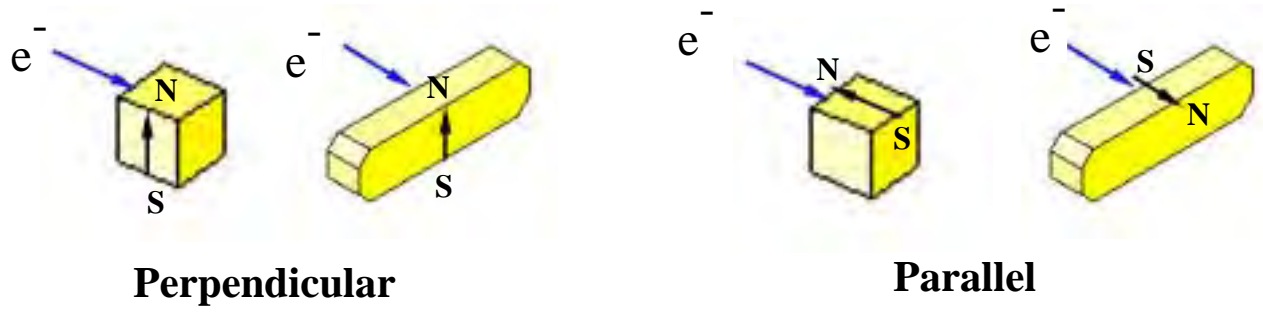
# Magnet stacking effects

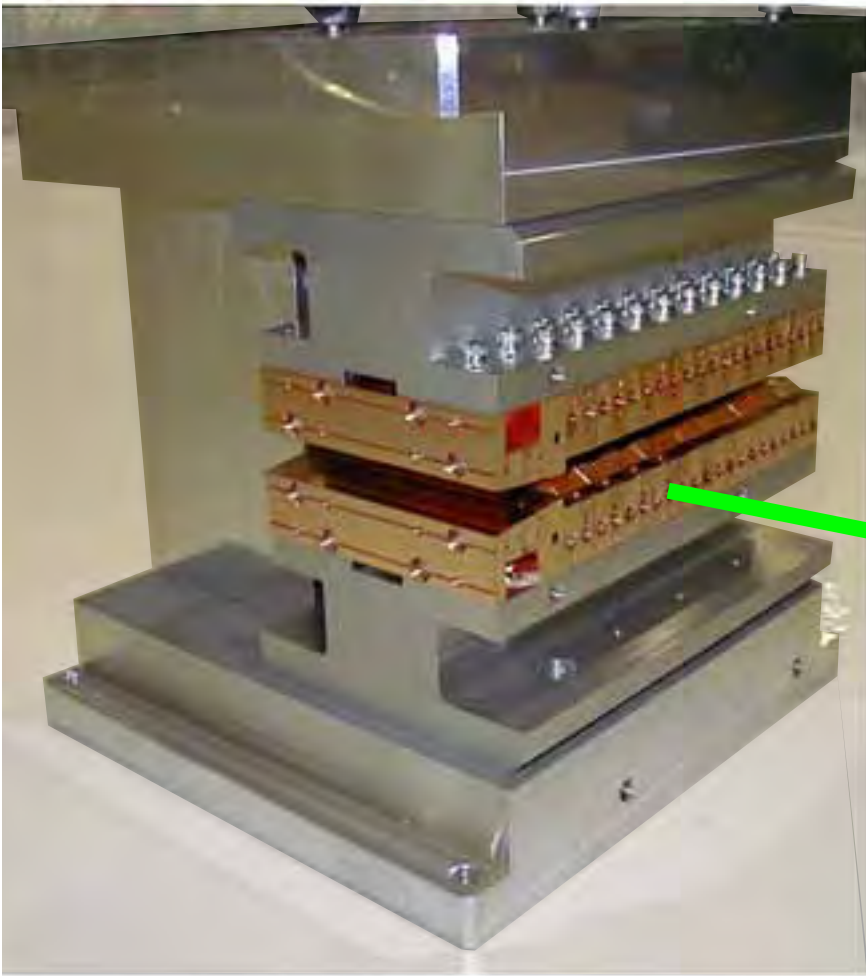


# Magnet shape and magnetized direction effects



Magnetized direction

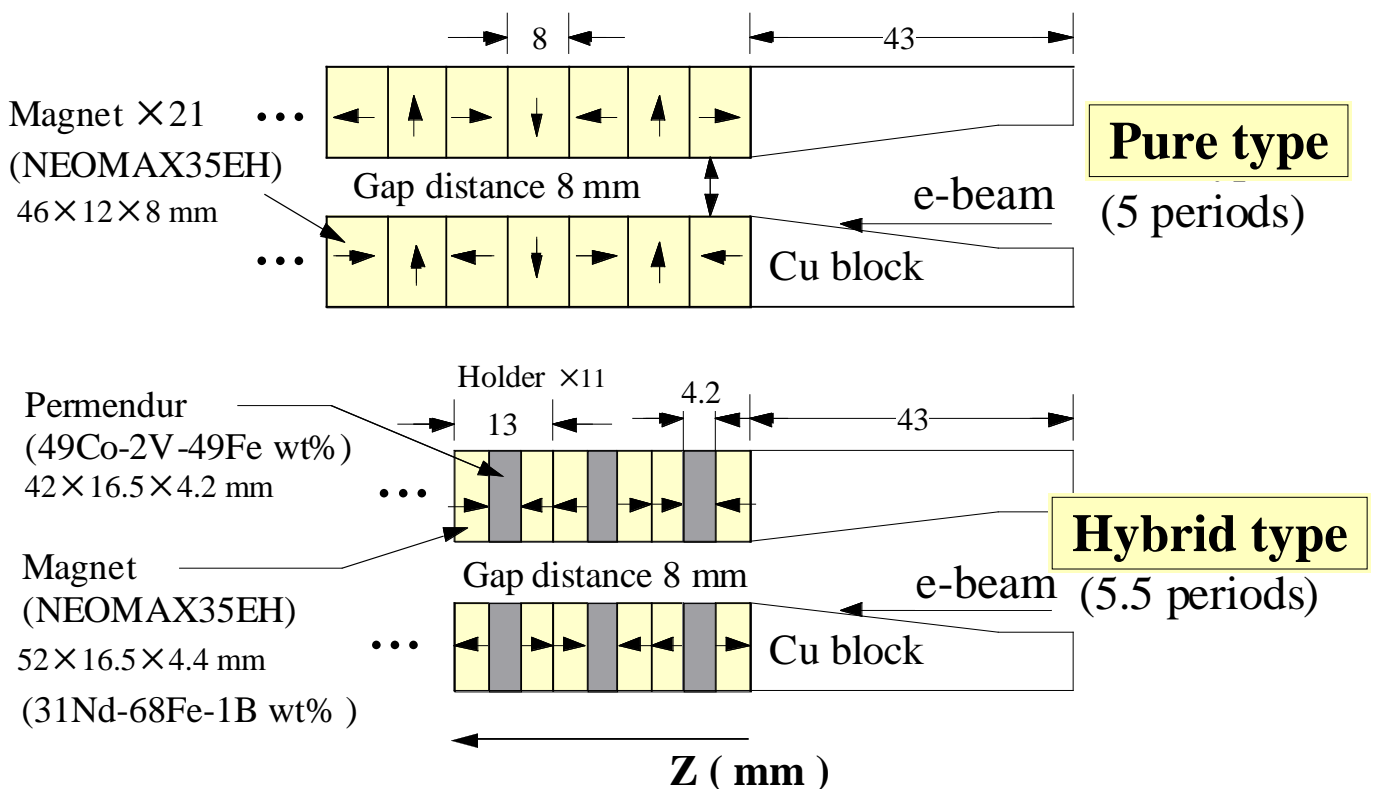
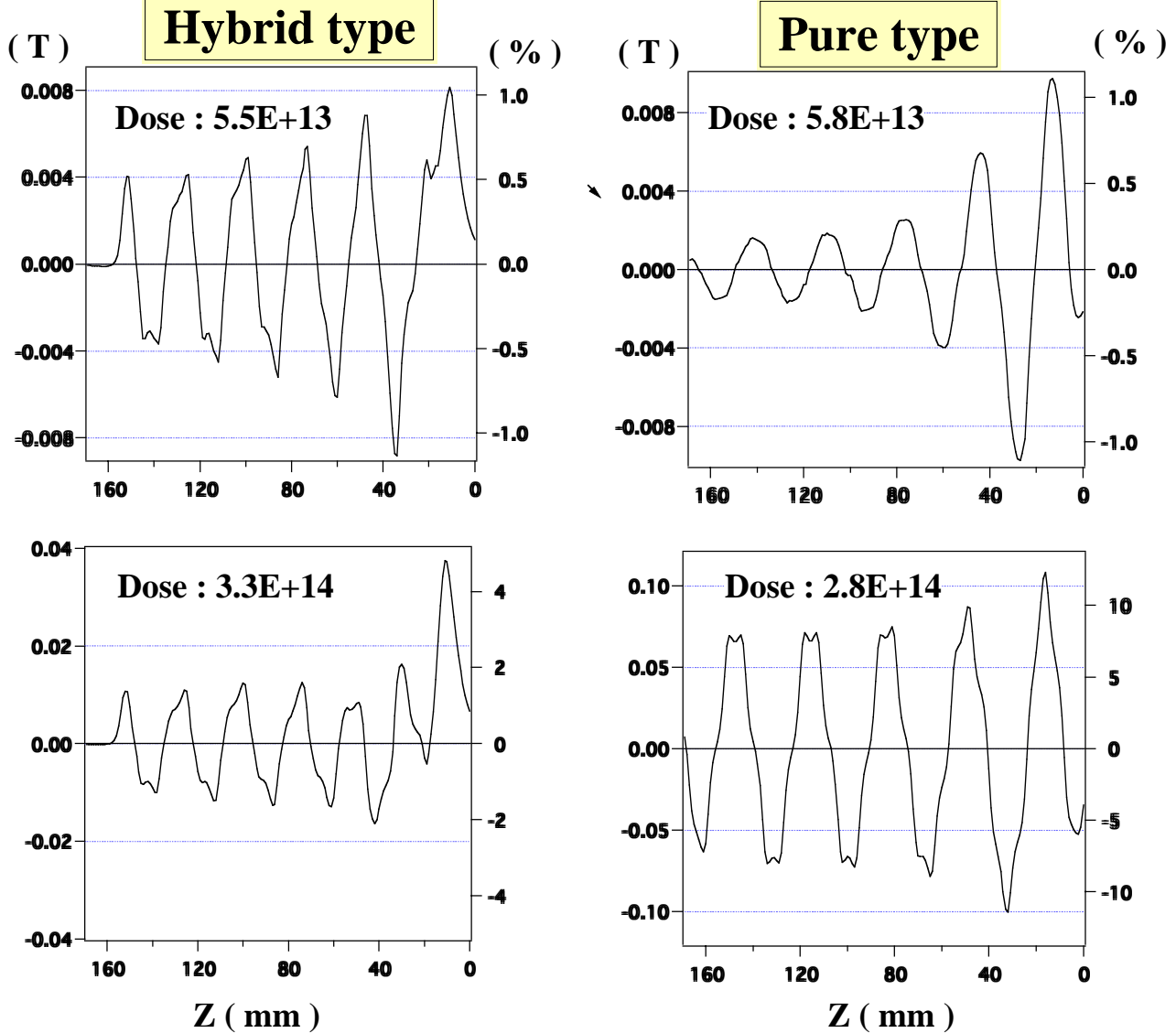




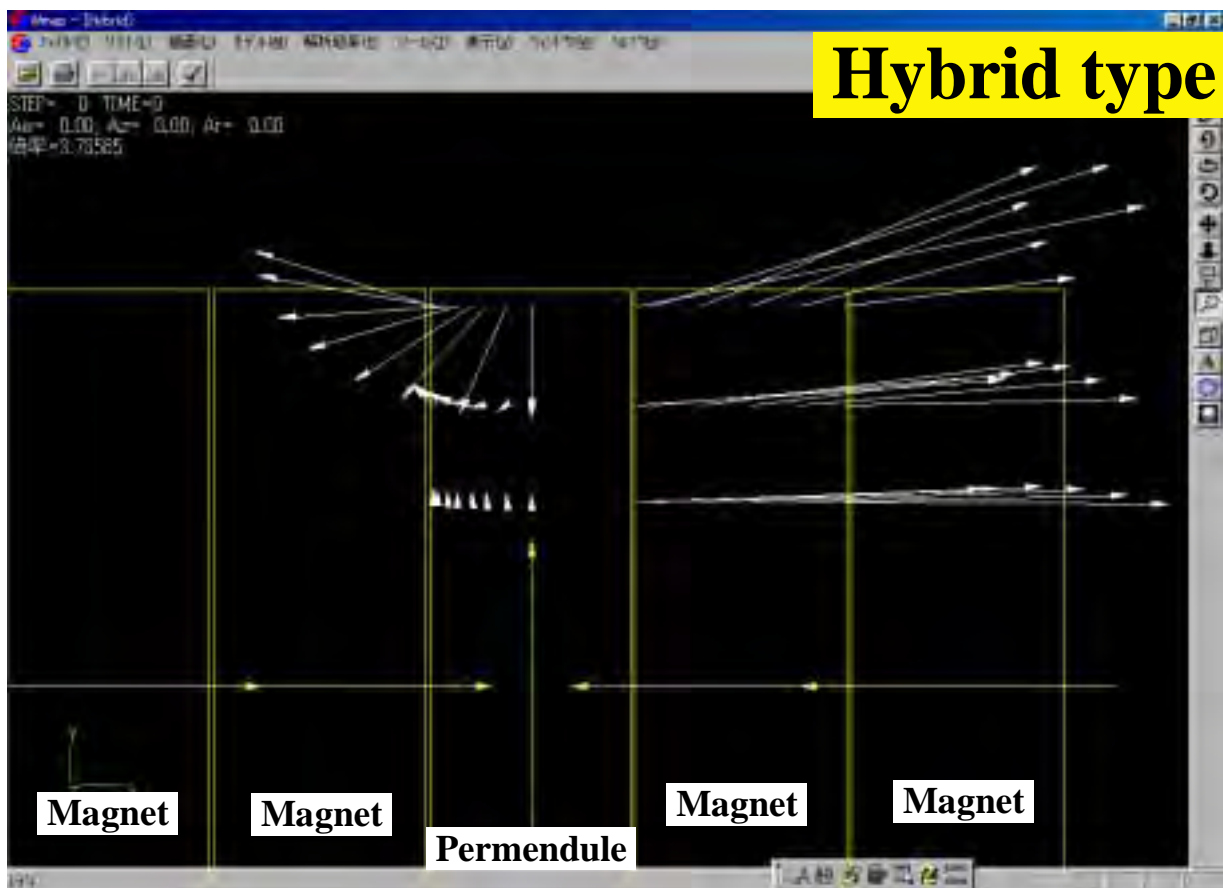
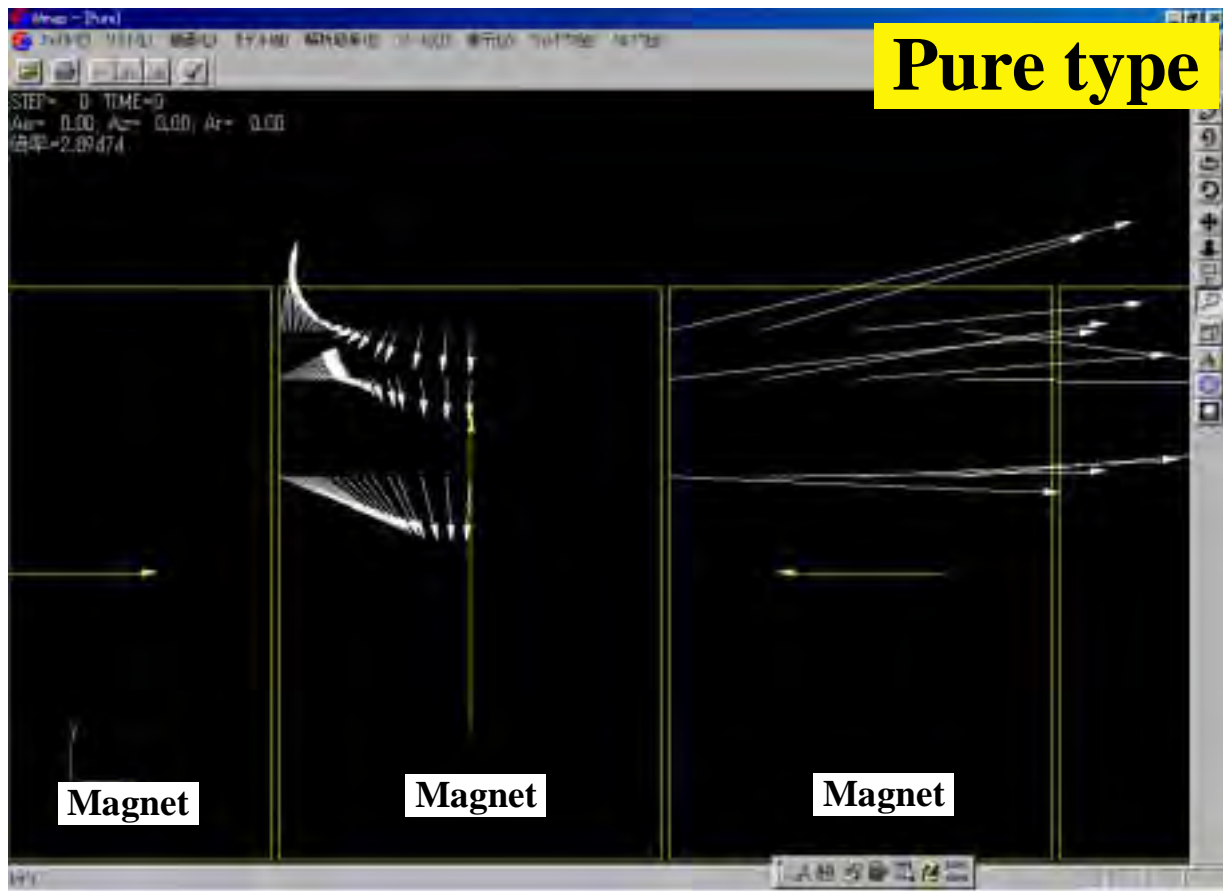
**Mag**

# Undulator model

# Magnetic distribution change of the undulator model



# Magnetic field in magnets



## Summary

**Radiation sensitivity is affected by ambient conditions**

## Future experiments

**Sm<sub>2</sub>Co<sub>17</sub> magnets irradiation \*1**

**Effects of demagnetizing field \*1**

**Effects of stabilizing treatment \*2**

**\*1 J.R.Cost reported the high radiation sensitivity in a bucking magnetic field.**

Metallurgical Transactions A (1990)

**\*2 E.R.Moog predicted the stabilization procedure makes magnets more resistance to irradiation.**

Proc. Of tenth National Conf. On Synch. Radiat. Inst. (1997)

