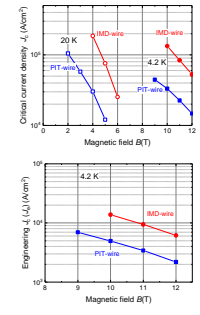
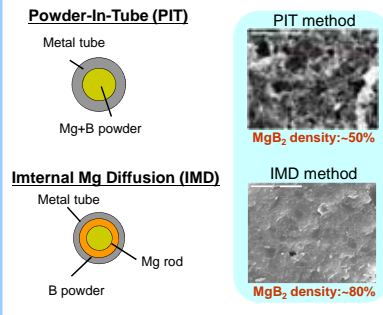


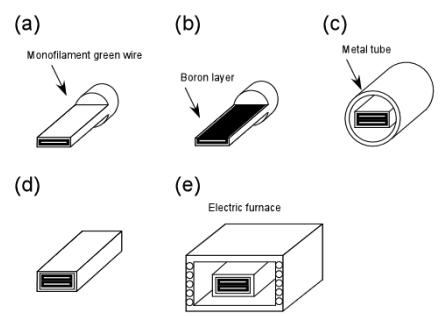
Background

- Conventional MRI magnets: Nb-Ti & Nb₃Sn Superconducting (SC) magnets
- Recent remarkable progress MgB₂ superconductor:
 - 1) higher J_c , J_e , 2) long length wire.
- This work: Superconducting joint made:
 - 1) easy fabrication process, 2) Microstructures and properties

IMD-MgB₂ wire and Joint fabrication

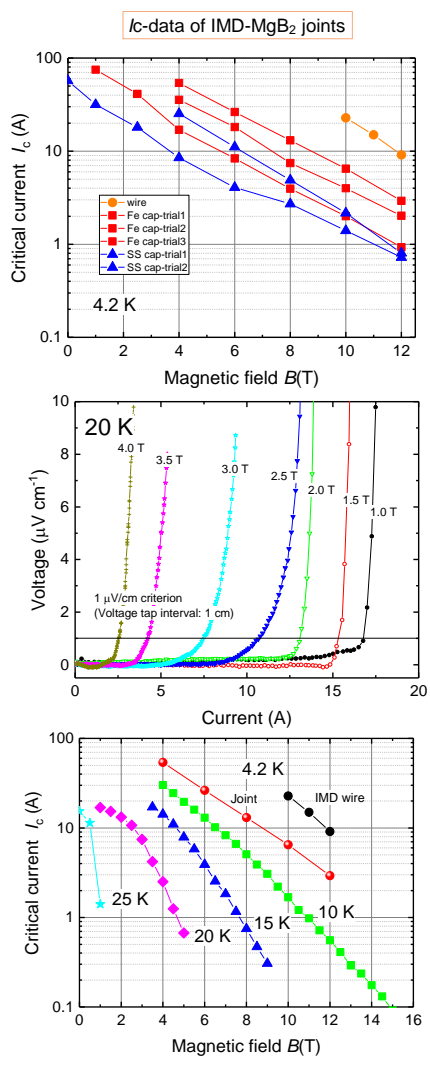
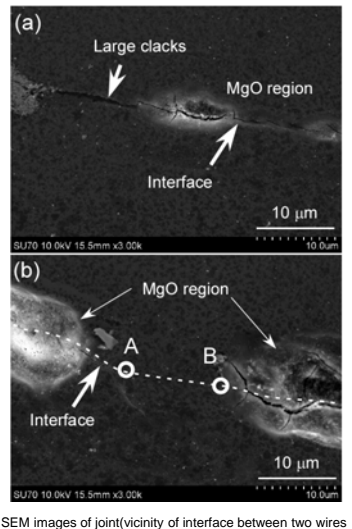
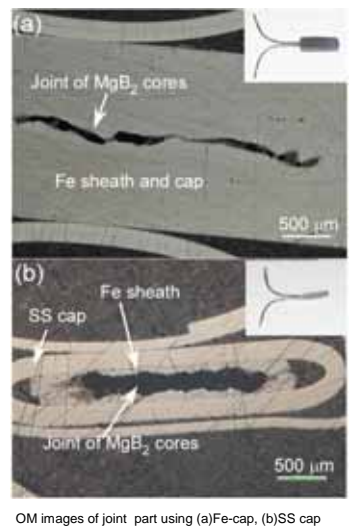


Long length > 100 m wire was fabricated.



Easy fabrication process of IMD-MgB₂ joint

1) Microstructures and I_c properties



2) Joint resistance

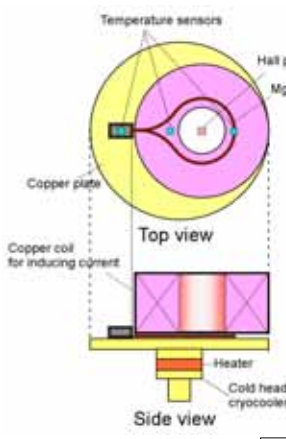
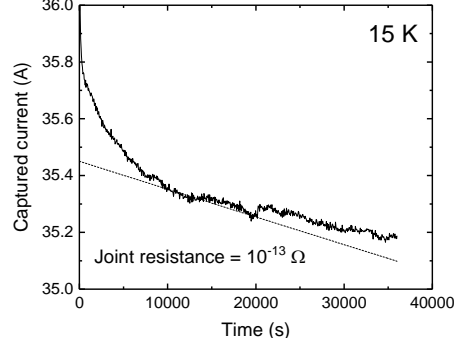
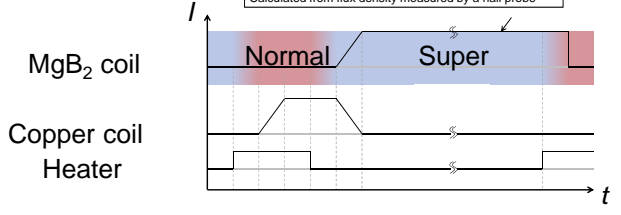


Table 1 Specifications of the MgB₂ coil

Diameter	90 mm
Number of turn	1 turn
Inductance	3.6×10^{-7} H

Table 2 Specifications of the copper coil

Diameter of the Cu wire	0.35 mm	
Coil size	I.D.	70 mm
	O.D.	210 mm
	Height	60 mm
Number of turns	25000 turn	



Timeline chart for trapping persistent current in the MgB₂ coil

Summary

- ✓ IMD-MgB₂ superconducting joint was made successful.
- ✓ 1) I_c value of joint part was over 10 A@8T, 4.2K, @4.5T, 15K.
- ✓ 2) Joint resistance = $10^{-13} \Omega$ @15K.
- ✓ This joint technique is very easy and have a good potential by optimization in the future.

Acknowledgement A part of this work was partly supported by JST ALCA. Authors would like to appreciate Dr. Ichiki and Dr. Tanaka of Hitachi Co. Ltd. for their help in our experiments.