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Induction Joining of In-situ MgB_2/Fe Wires and FEM Simulation of the Magnetic Heating System

(plus an Introduction to BAIBU and its Nuclear Radiation Detectors Research Center)

15/10/2025 h. 14:30, Via della Vasca Navale 109, aula N22
Streaming Teams: <https://tinyurl.com/RomaTre-MgB2joints-2025>

In this talk, I will present the application of induction heating to both the synthesis of MgB_2/Fe superconducting wires and the fabrication of superconducting joints of MgB_2/Fe monofilament wires, fabricated and joined using a custom-built induction system. The joints were made in-situ and annealed for different durations. The superconducting phase is formed even at the shortest 1-minute induction annealing time. A finite element model was developed to simulate and optimize the heating process, to guide future improvements in the induction system for efficient fabrication of superconducting wires and joints.

This study has been carried out at Bolu Abant İzzet Baysal University (BAIBU), which provides strong research facilities and a growing infrastructure for studies on superconductivity and advanced materials.

Finally, I will briefly introduce the Nuclear Radiation Detectors Research Center at BAIBU, which focuses on the development and characterization of radiation detection technologies and offers specialized laboratories and equipment for interdisciplinary research.

Prof. Mustafa Akdoğan received his PhD in Physics from Bolu Abant İzzet Baysal University in 2009. His research focuses on superconducting materials, magnetic induction processing, and advanced materials characterization. He has been group partner in 12 national and international projects and has been visiting scientists in Italy and Japan.