Effects of Reinforcement with Fe-Mn-Si Shape Memory Alloy Ring on Mechanical and Magnetic Properties of Bulk Y-Ba-Cu-O Superconductors

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Abstract- Fe-Mn-Si alloys are ferrous shape-memory alloys that exhibit a large amount of the recoverable strain due to the shape memory effect. We reinforced bulk Y-Ba-Cu-O superconductor with the Fe-Mn-Si alloy rings and studied the effects of the reinforcement on magnetic and mechanical properties of bulk Y-Ba-Cu-O. The amount of the recovery strain of the shape memory ring was about 1-4%. The cracks were not introduced into the bulk superconductor with the treatment. It was interesting to note that the trapped magnetic field was improved after the reinforcement.

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