Fabrication of Highly Textured IBAD-MgO Template by Continuous Reel-to-reel Process

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Highly textured ion–beam-assisted deposition (IBAD) template of MgO was successfully fabricated using a continuous reel-to-reel mode. The overall process consists of reel-to-reel electropolishing of a hastelloy C276 tape, deposition of Al_2O_3 diffusion layer and Y_2O_3 seed layer, deposition of IBAD-MgO and epi-MgO layer. The IBAD-MgO templates were fabricated using the IBAD system with 275 cm deposition zone and 32 cm diameter ion source. To enlarge the deposition area, every processing step was carried out by the improved IBAD system with 14 multi-turn and five heating zone in. The texture of MgO films during IBAD process was monitored by in-situ reflection high-energy electron diffraction (RHEED) to optimize the IBAD process. 10m long IBAD-MgO tapes with in-plane texture of $\Delta\phi < 15^{\circ}$ have been fabricated. In this presentation, detailed deposition processes of IBAD-MgO template will be reported together with the results of textures. This research was supported by a grant from Center for Applied Superconductivity Technology of the 21st Century Frontier R&D Program funded by the Ministry of Science and Technology, Republic of Korea.

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