

## Jc enhancement by La-Al-O doping in Y-Ba-Cu-O films both in self-field and under magnetic field - DTU Orbit (08/11/2017)

### Jc enhancement by La-Al-O doping in Y-Ba-Cu-O films both in self-field and under magnetic field

To enhance the  $J_c$  of  $YBa_2Cu_3O_{7-x}$  (YBCO) films both in self-field and under magnetic field, an effective strategy is to introduce artificial pinning centers and keep a good YBCO matrix at the same time. Here, we propose a new dopant:  $LaAlO_3$  (LAO), based on its chemical stability and small mismatch toward YBCO. A series of YBCO films with different LAO doping contents was fabricated on LAO single-crystal substrates by metal organic deposition. We observed by X-ray diffractometer measurements and scanning electron microscopy observations that although a large amount of LAO is added, YBCO still keeps a good epitaxial growth relationship with LAO. Compared with a pure YBCO film, the  $J_c$  value of a 5.0% LAO-doped sample is enhanced more than three times in self-field 77 K and seven times at 77 K and 1.5 T, respectively. These results indicate that LAO doping can effectively enhance the  $J_c$  of YBCO films both in self-field and in applied magnetic fields.

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