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Title:The fabrication of THz emitting mesas by reactive ion-beam etching of superconducting Bi2212 with multilayer masks
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Abstract:
Generation of powerful THz radiation from intrinsic Josephson Junctions (IJJs) of Bi2Sr2CaCu2O8+delta (Bi2212) may require mesas with large lateral dimensions. However, there are difficulties in fabrication of perfect rectangular mesas. The lateral angles of mesas should be close to 90 degrees to obtain IJJs with same planar dimensions for synchronization of IJJs. We patterned Ta/photoresist and photoresist/Ta/photoresist masks on Bi2212 and used selective ion etching to overcome the thick photoresist layer shading on the lateral dimension of mesa during the ion-beam etching. The reactive ion-beam etchings have been done with ion beams of Ar, N-2 and O-2, and we have obtained mesas about 1 mu m with lateral angle of approximately 50 to 75A degrees, which is better than the mesas fabricated with photoresist mask.
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