

Millimeter Wave Property of High T_C Josephson Junction Fabricated on Bicrystal and Step-edge Substrates of Sapphire.

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We have fabricated $\text{YBa}_2\text{Cu}_3\text{O}_7$ Josephson junctions on two types of Sapphire substrate for millimeter wave property; 1. bicrystal 2. step-edge. The $\text{YBa}_2\text{Cu}_3\text{O}_7$ thin film was deposited by pulsed laser deposition (PLD) and patterned by Photolithography and ion milling etching. To investigate the millimeter wave property of the two types of the junctions, Shapiro steps were measured by using 60 GHz gunn-diode generator. From the Shapiro steps, we calculated the maximum upper frequency and the received power in the temperature range from 15 K to 70 K.

Keywords: millimeter wave, Josephson junction, Shapiro steps