

HTS Broadband-array Antennas for Satellite Communication

Dong-Chul Chung*

*Div. of Information, Communication and Computer Eng.,
Woosuk University, Wanju, Chonbuk, 565-701 Korea*

We have designed and fabricated superconducting Broadband antennas for Ku band using a $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ (YBCO) superconducting thin film on MgO substrate for broadband operation. Our antennas based on the design of equilateral triangular patches and have a resonant frequency of 20 GHz. Until now the major limitation of high- T_c superconducting (HTS) microstrip antennas is the narrow bandwidth due to the high Q and thin substrate. Defining bandwidth as the frequency range over which standing wave ratio (SWR) 2:1 or less HTS antenna bandwidths are typically in and around the 1 %. The bandwidth of our HTS antennas was dramatically 6.5 %. The input impedance and other characteristics for our antennas were calculated using moment method techniques. Also 2 x 1 HTS broadband antenna array are designed and fabricated using above the same method. Experimental results for our HTS antennas were reported in terms of radiation patterns, return loss, bandwidth, and other various characteristics.

keywords : HTS antennas, broadband, microstrip, standing wave ratio