

# Electric Field Dependence of Electrical Characteristic and Microwave Property on MgO Bicrystal Josephson Junction with PVDF Gate Electrode

Yongju Yun, Hyeoungmin Kim, Gwangseo Park <sup>a</sup>, Jin-Tae Kim <sup>b</sup>

<sup>a</sup> *Sogang University, Seoul, Korea*

<sup>b</sup> *Korea Research Institute of Standards and Sciences, Taejeon, Korea*

We have fabricated a high- $T_c$  superconducting transistor with polyvinylidene fluoride (PVDF) gate electrode on MgO bicrystal Josephson junction by thermal evaporation and spin-coating. The PVDF ferroelectric film is found to be suitable for a gate electrode of the superconducting transistor since it has not only small leakage current but also high dielectric constant at low temperature. For the application of superconducting-FET, we investigated the electric field effect on  $I_C$  and  $R_N$ , and millimeter wave property (60 GHz band) of Josephson junction.

Keywords: Millimeter wave, PVDF ferroelectric material