

# Transport Properties of Ramp-edge Junction with Columnar Defects

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We have investigated the transport properties in  $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$  (YBCO) ramp-edge junctions fabricated with 2 and 5  $\mu\text{m}$  width that are irradiated by heavy ion-beam. We observed that RSJ-like behavior in the range from 40K to 60K and the normal state junction resistance ( $R_n$ ) was almost constant of temperature. From the linear dependence of critical current ( $I_c$ ) on temperature, the junctions seem likely to behave as SIS (Superconductor-Insulator-Superconductor) type junction. Noise measurement showed that  $I_c$  fluctuation peak increases with increasing temperature, whereas  $R_n$  fluctuation remains almost constant. Comparing with the model  $I_c$  and  $R_n$  fluctuations are seemed to be antiphase correlated and  $I_c R_n \sim J_c^q$  with  $0.4 < q < 0.8$ .

keywords : ramp-edge junction, noise, Josephson junction, multilayers