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Current voltage measurements on magnetic ZnO /$Y_1Ba_2Cu_3O_{7-\delta}$ thin film heterostructures N. GHOSH, H. SCHMIDT, H. HOCHMUTH, M. LORENZ , Q. XU , M. GRUNDMANN, Institut für Experimentalle Physik II, Fakultät für Physik und Geowissenschaften Universität Leipzig, Germany , G. WAGNER , Institut für Mineralogie, Kristallographie und Materialwissenschaft, Universität Leipzig, Germany — We have grown ca. 200 nm magnetically doped ZnO films on $Y_1Ba_2Cu_3O_{7-\delta}$ on r-plane sapphire by pulsed laser deposition for future Andreev Reflection(AR) measurements to determine spin polarization. The critical current density, 5 x 10^6 A/cm^2, of the YBCO films at zero field and 77K [1]remains in same range after growth of granular doped ZnO and critical temperature is still above 77K. Four-point transport measurements across the ZnO/YBCO interfaces with junction area (A $\geq$ 1 mm^2) resulted in nonlinear I-V characteristics. The observed conductivity fluctuations at zero bias in the low temperature range are masked by heavy noise due to the large A lying in the Maxwell range ($d \gg l$, d = contact radius, l = mean free path). Fitting the conductivity data according to the Blonder-Tinkham-Klapwijk 0K theory shows that the superconducting gap (Δ) of YBCO and ZnO/YBCO barrier strength (Z) amount to $\leq$ 20.4 ($\pm$1) meV and $\geq$0.74($\pm$ 0.23), respectively. Smaller junction area with reduced scattering AR measurements are under work. [1]M.Lorenz etal. IEEE Transactions on Applied Superconductivity 11(2001)3209.

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