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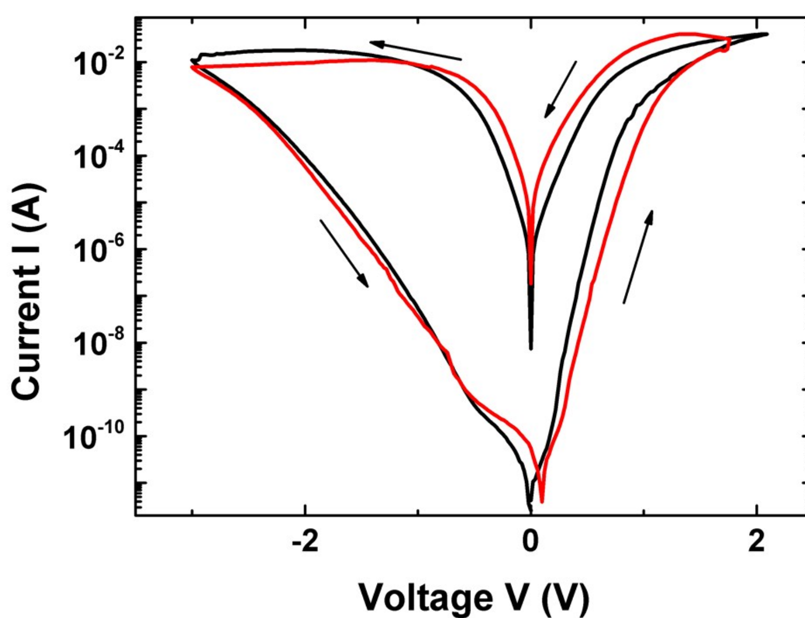
Supplementary Information

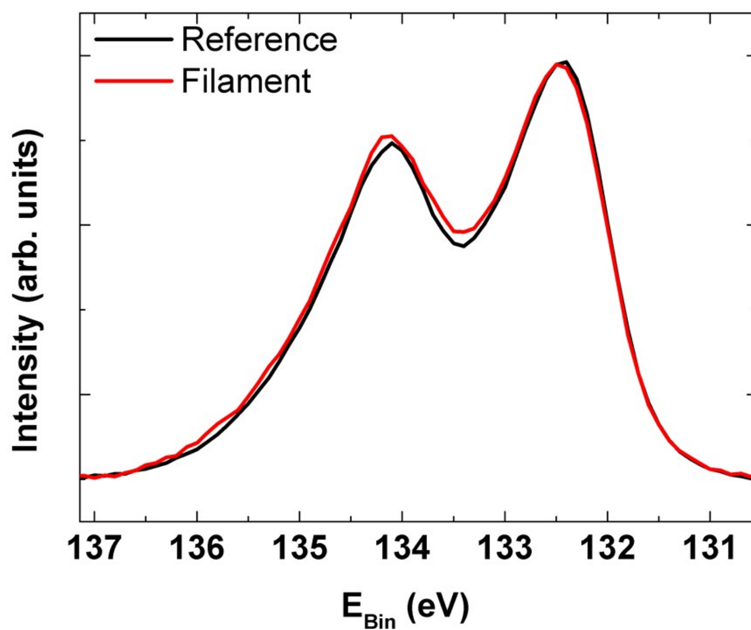
Verification of redox-processes as switching and retention failure mechanisms in Nb:$SrTiO_3$/metal devices

C. Baeumer,[a] N. Raab,[a] T. Menke,[a] C. Schmitz,[a] R. Rosezin,[a] P. Müller,[a] M. Andrä,[a] V. Feyer,[a] R. Bruchhaus,[b] F. Gunkel[a,c], C.M. Schneider,[a] R. Waser[a,c] and R. Dittmann[a]

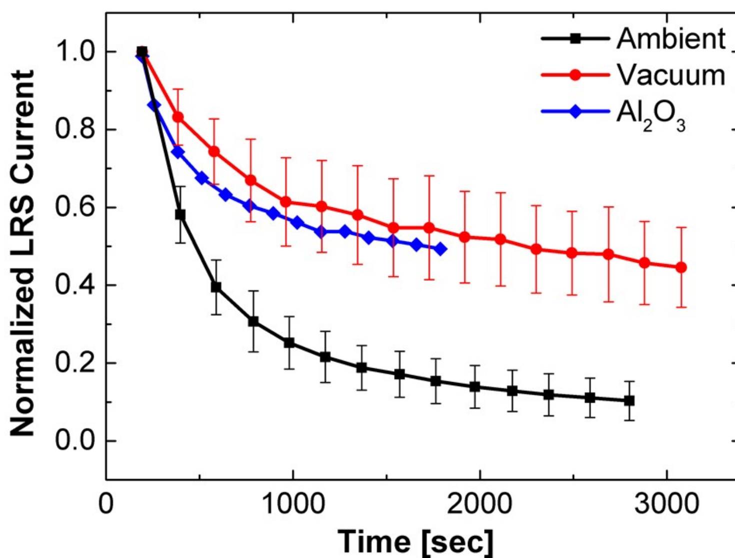
Supplementary Figures



Supplementary Fig. 1: *I*-*V*-characteristic of Pt/Nb:$SrTiO_3$ junctions and Au/Nb:$SrTiO_3$ junctions (black and red lines, respectively).



Supplementary Fig. 2: Sr 3d spectra for the filament and the surrounding (red and black line, respectively) for the device switched back to the HRS shown in Fig. 4e and f of the main text.



Supplementary Fig. 3: Retention measurement of the LRS (low current limit → homogeneous switching) under ambient and vacuum conditions (black and red symbols, respectively). The retention times can also be improved through the insertion of a thin Al_2O_3 layer (blue symbols).