Field-induced Point Defect Redistribution in Metal Oxides: Mesoscopic Length Scale Phenomena

(Award 1132058, 9/15/11-9/14/15, Elizabeth Dickey, PI; Ali Moballegh, PhD student; Brandon Shaw, Undergraduate Student)

Program Goals:
To develop a phenomenological understanding of bias-induced defect redistribution in transition metal oxides at the mesoscopic length scale specifically taking into account the effects of extended lattice defects and electrode boundary conditions.

Schematic of charged point defect migration during DC biasing.

Electric Field (volt/cm)
Current Density (amp/cm²)

Electrode electrical characterization

Local microanalysis near electrodes

Montage

- Contact (+)
- Bulk (-)