

OTS MATERIAL ELECTRICAL PARAMETER MAPPING FROM THEORETICAL ELECTRONIC STRUCTURE

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Large array resistive memories require a simple 2-terminal access device, so-called *selector*, in series with each memory cell in order to avoid ‘sneak-path’ leakage and cell misreading.[1] Ovonic Threshold Switching (OTS) materials are some of the most promising candidates for such a selector. In our endeavor to find yet undiscovered OTS materials, we investigated both theoretically (first-principles simulations)[2] and experimentally (device integration and electrical characterization)[3] a series of known OTS compositions to find theoretical-experimental parameter correlations. These correlations will help us further to screen and down select from thousands of possible elemental combinations a short-list of most promising materials to be further experimentally proven.

Keywords

OTS, selector.

References

- [1] S. Clima et al., Phys. Status Solidi RRL, 1900672 (2020).
- [2] F. Tavanti et al., ACS Applied Electronic Materials 2, 9, 2961 (2020).
- [3] Buscemi et al., Submitted.