MAR14-2013-001221

Abstract for an Invited Paper
for the MAR14 Meeting of
the American Physical Society

Electrocaloric energy efficiency and cooling power

NEIL MATHUR, University of Cambridge

How much energy is required to drive electrocaloric effects near ferroelectric phase transitions? I will compare electrocaloric ceramic and polymer films with each other, with magnetocaloric materials (exploited in over 40 prototype refrigerators), and with elastocaloric materials. I will also discuss the cooling power that could be achieved in electrocaloric heat pumps based on multilayer capacitors in which heat flow is modelled using finite element analysis.