

SIMULATION OF THE LINEAR AND NONLINEAR RESPONSE TO AN ELECTRICAL EXCITATION IN A THERMOELECTRIC NETWORK USING SPICE

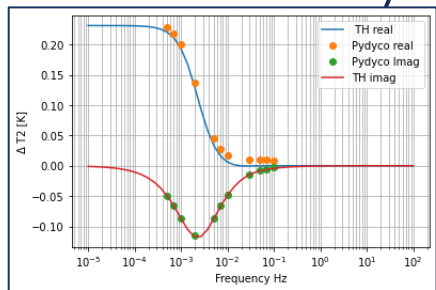
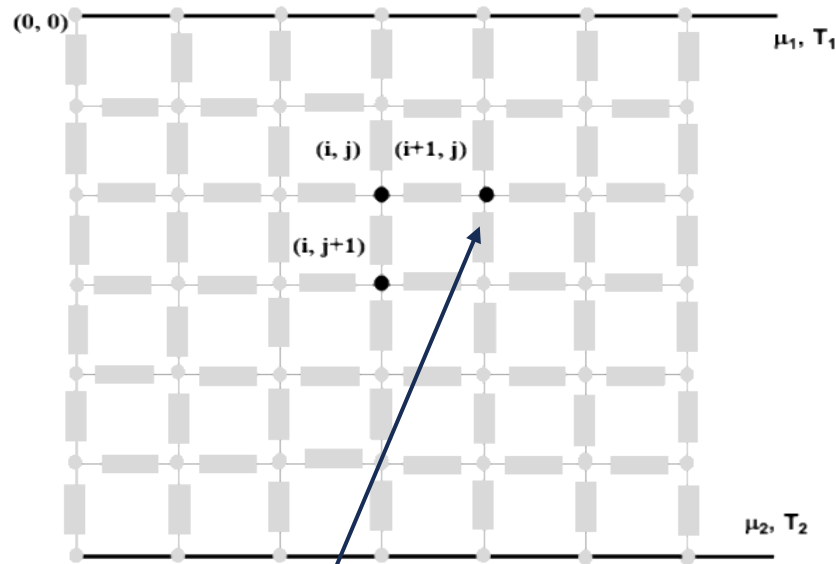
M-A. MAMOUNI^{1,2} , CH. GOUPIL¹ , PH. LECOEUR²

¹Center for Nanoscience and Nanotechnology (C2N), CNRS, Université Paris-Saclay, 91120 Palaiseau, France

²Laboratoire Interdisciplinaire des Energies de Demain (LIED), CNRS UMR 8236, Université Paris-Cité, 5 Rue Thomas Mann, F-75013 Paris, France



PYDYCO SIMULATOR: SIMULATING THERMOELECTRICITY



Overview:

- A solver, written in Python with the exploitation of Spice kernel, following the nodal description of thermoelectricity.
- Simulation of $n \times m$ sized network with heterogeneous structure and different physical properties.
- Taking into consideration the nature of the boundary conditions of temperature, and electrochemical potential.
- The simulation can be either static or harmonic.

We present:

- The simulation of an E-type thermocouple response to harmonic electrical excitation, linear and nonlinear response and we compare them to the analytical expressions in the literature.

Fig - Example of 11x14 network simulated in PyDyCo and the result expected.