

A modeling study of an active oscillating generator validated by an experimental case is presented in this paper. The generator utilizes Gadolinium (Gd) as a ferromagnetic material working as an active heat carrier fixed with a coil to generate electrical energy by moving inside a non-uniform magnetic field. Gd was chosen due to its unique thermomagnetic property where its Curie temperature (T_c) is close to room temperature. This system requires a difference in temperature between two separated surfaces, allowing the magnetic property of the metal to change from the ferromagnetic to paramagnetic and vice versa. The Gd oscillates up and down due to the magnetic potential and gravitational energies. COMSOL Multiphysics 5.2a software is used to simulate the system and get the results in different cases. Frequency and the amount of heat dissipation are the two main factors in this study. This technique promises to enhance applications in need of cooling to improve their performance.