

In this paper, we study the performance of a new thermomagnetic generator (TMEG) and present the results using COMSOL Multiphysics. The TMEG works by utilizing a magnetic field that varies based upon change in temperature. Specifically, the function of the system focuses on the changing magnetic susceptibility of materials with respect to temperature. A ferromagnetic material (FM) is the moving part in this system, where it moves in opposite direction under the influence of a permanent magnet and a spring between two unequal temperatures zones. Two ferromagnetic materials having different magnetic and thermal properties were chosen based on temperatures of two separate zones. The first serves as a heat conveyer from the heat source to a central area while the second zone transfers the stored heat to the heat sink. The central area is a non-magnetic material that is considered to be as a heat sink for the first but as a heat source for the second. This system is able to transfer the heat far away from the source through a series of TMEG units. Theoretical results are presented using COMSOL Multiphysics 5.2a. This system can be used as a co-generation energy device, but it must have a temperature excess of 400 C at the hot side.