

T2_23 COLOS IDEAS APPLIED TO THE STUDY OF A VACUUM TUBE DIODE

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In this communication a simulation of the vacuum tube diode is presented. The components of such a diode are a plain cathode and a plain anode. In the first place, a study of the (2D classical) thermionic emission taking place at the cathode is carried out in terms of a gas contained in a square box, the particles of this gas can cross one of the sides when they have energy greater than the extraction energy. Secondly, the characteristic curve of the diode (current vs. applied voltage) is simulated in the space charge regime. This simulation is based on the interaction of the emitted electrons with the applied electric field and with the field of the other emitted electrons. In this way, two problems usually studied in terms of statistical physics and advanced electromagnetic partial differential equations are studied in terms of some few well known basic laws: the mechanical ones needed for studying elastic collisions and Coulombs law. This approach is at the core of the CoLoS (Conceptual Learning of Science) way of teaching.