T6_60 CONSERVATION OF CHARGE TO UNDERSTAND POTENTIAL USING ON LINE CHARGE MEASUREMENTS

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As concerns students' learning of electrical phenomena, potential turns out to be one of the most problematic concepts: its role is not recognized either in electrokinetics or in electrostatics. In this area, in particular, the transfer of charge between conductors is interpreted according to the Coulomb law and looking at the same amount of an entity (mostly charge) on them as a balancing factor in the process, without giving a meaning to potential. Moreover, students' ideas often imply a lack of awareness about the conservation of charge. The inclusion of the concept of potential as a magnitude running the transfer of charge was planned in a vertical path on electrostatics using a strategy based on simple experiments. Measurements of charge show the inconsistency of models based on that quantity compared to the phenomenology and motivate the introduction of potential. The need for quantitative measurements, with good sensitivity, repeated in a short time, without loss of charge on the measured systems makes the on - line measure (made with a Faraday ice pail) a determining factor of the experiment. It consists of successive transfers of charge by contact between conductive spheres of equal and different sizes, one or both charged. The measure of the charge on the spheres before and after each contact allows us to see its conservation as a constant of the processes and to analyze the ways of its transfer: in particular, an increase of the difference in charge after a contact turns out to be contradictory with respect to the interpretative model reported as usual by literature.