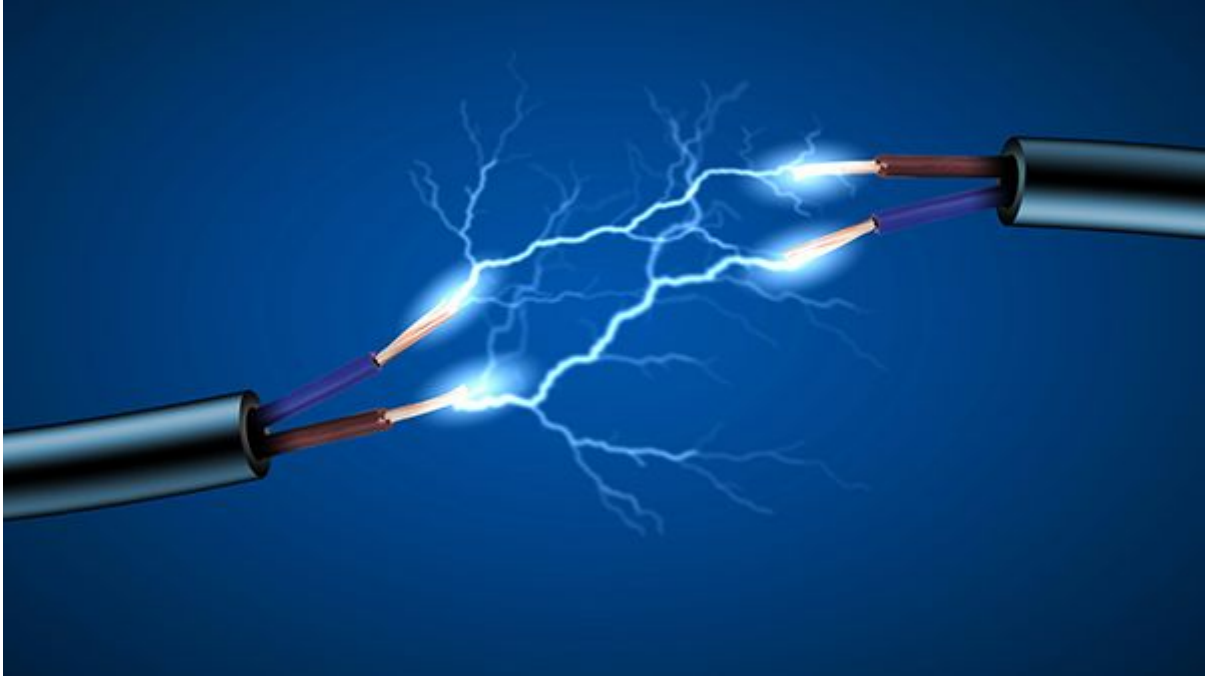


# *1<sup>st</sup> Lab practice*

*Devices and measurement instruments.*



*September/15<sup>th</sup>/2017*

*Group A*

*(Tables 1 and 2)*

*Alejandro Brown*

*Stéphane Díaz-Alejo*

*Enrique Llopis*

*Ignacio Loyola*

*María Romero*

## ***Theoretical section:***

### ***-Theoretical background:***

This report discusses an experiment to study the relationship of the amperage and resistance with the voltage of a given circuit. As Ohm's law states that the current through a conductor between two points is directly proportional to the voltage across the two points. Introducing then the constant of proportionality, the resistance, we deduce the mathematical equation that describes this relationship.

$$I = V/R$$

Where **I** is the amperage in the circuit given in amperes, **V** is the voltage measured in units of volts, and **R** is the total resistance of the elements (resistors) and the conductor among the electrical circuit. Ohm's law will state that the resistance on this equation will remain constant independent of the current.

This law was thought to fail at an atomic scale, but experiments have not borne out this expectation. This together with the generalization from many experiments that have shown that current is approximately proportional to the electric field for most materials, we say that Ohm's law is an Empirical Law.

### ***-Objectives:***

- Know all the measurement instruments of this laboratory, how they work, their most important parts, their utility... For instance: the D.C. Source, the Function generator (A.C.), the Multimeter and the Oscilloscope.
- Learn how to use Excel spreadsheet to introduce data in cells, perform different calculations and graphic drawings (obtaining the mathematical equation).
- Understand the differences between: D.C. (direct current) and A.C. (alternating current); review the Ohm's Law...
- Have a base to face the next laboratory practices.

## ***Experimental section:***

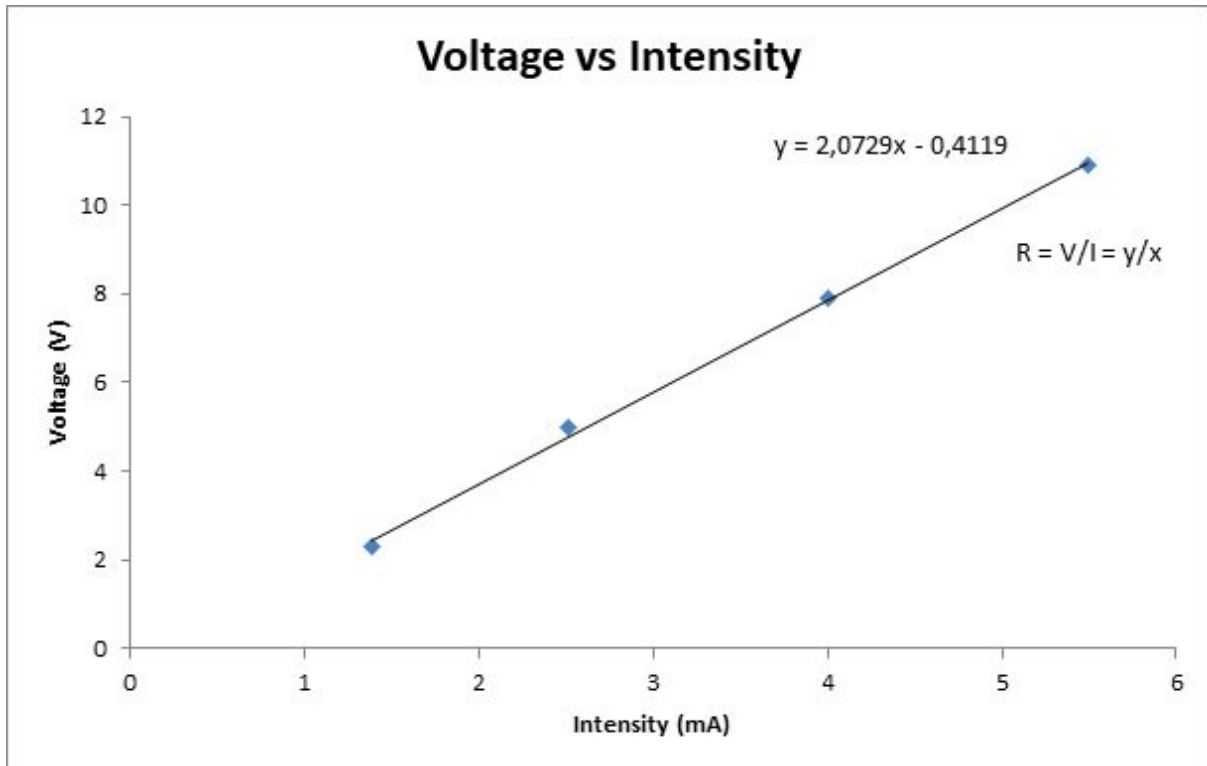
### ***-Results:***

Voltage (V)	Intensity (mA)	Resistance ( $\Omega$ )
2,3	1,382	1,664254703
5	2,513	1,9896538
7,9	4,002	1,974012994
10,9	5,489	1,985789761

### ***-Computations:***

Voltage/Intensity=Resistance (V/mA= $\Omega$ )

### ***-Graph:***



### ***Discussion and conclusions:***

From this lab session we have learnt several tools that will help us through all the course. We have learnt the basics of Excel, the measurements and the devices we will be using during the lab sessions. Moreover, we have reviewed the theoretical background we are supposed to know already (Ohm's Law, direct current, alternating current...).