



A CRYOGENIC SET-UP FOR LOW FREQUENCY NOISE CHARACTERIZATION OF ELECTRONIC DEVICES



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SPECIFICATIONS OF THE SYSTEM SET-UP

❖ THE PROJECT CONSISTS IN THE REALIZATION OF A CRYOGENIC SET-UP CAPABLE TO REALIZE CHARACTERIZATION OF THE DYNAMIC AND NOISE PERFORMANCES OF TRANSISTORS AT ANY FREQUENCY AND CRYOGENIC TEMPERATURES.

➤ THE AIM IS TO MEASURE THE NOISE DOWN TO VERY SMALL FREQUENCIES. MECHANICAL VIBRATIONS MUST BE AVOIDED TO PREVENT MICROPHONISM EFFECTS THAT CAN IMPAIR THE MEASUREMENTS.

WE HAVE REALIZED A VERY SIMPLE AND CHEAP SOLUTION THAT FULLY FULFILL THE SPECIFICATIONS. ITS CHARACTERISTICS ARE:

1. IT DOES NOT NEED THE VACUUM AROUND THE DEVICES TO BE TESTED;
2. THE SELECTION OF THE TEMPERATURE OF INTEREST IS FULLY AUTOMATIC;
3. THE SYSTEM IS DESIGNED TO HAVE A VERY SMALL STATIC CRYOGENIC LIQUID CONSUMPTION, WHICH ALLOWS VERY LONG MEASUREMENTS;
4. NO HEATER IS USED TO SET THE TEMPERATURE;

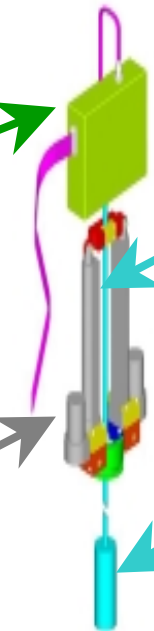
THE SETUP

IN THE BOX IT IS LOCATED THE SECOND STAGE OF AMPLIFICATION AND DIAGNOSTIC.

INSIDE THE STAINLESS STEEL TUBE THERE ARE THE CONNECTING WIRES FROM THE COLD TRANSISTORS TO THE ROOM TEMPERATURE.

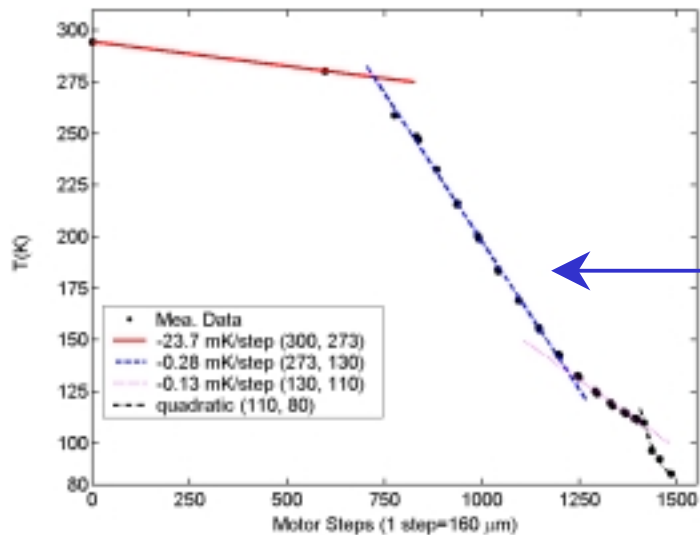
TWO MOTORS MOVE THE STAINLESS STEEL TUBE THAT SUSTAINS THE SAMPLE HOLDER. THE DISTANCE ABOVE THE LIQUID LEVEL ALLOWS TO SET THE TEMPERATURE.

THE DEVICE UNDER TEST IS CLOSED INSIDE THE ALUMINUM CYLINDER.



PERFORMANCES

AN EXAMPLE OF NOISE MEASUREMENT IN THE LOW FREQUENCY REGION OF A VERY GOOD JFET.



CHARACTERISTIC OF THE TEMPERATURE AS A FUNCTION OF THE POSITION ABOVE THE LIQUID.

