

Practical work n°1: Measurements and uncertainties L-Introduction Experience shows that any numerical result obtained from any measurement has some uncertainty even if the measurement has been made as carefully as possible. The result obtained will always depend on the working conditions, the equipment and the method used. It is therefore important to know the factors that can influence this uncertainty and to act in such a way as to keep it as low as possible. The interest of our results often depends on our effectiveness in estimating these limits. This uncertainty, also called error, obviously has nothing to do with the fact of having made a mistake in making the measurement. In reality, whatever the methods of measurement, the quality of the apparatus and the aptitudes of the experimenter, a result is always tainted that it is advisable to estimate, and better still to calculate. Thus the measurement of a quantity can only be approximate because of the limited precision of the measuring devices, execution errors, errors in the operation or the graduation of the measuring devices, etc. A measurement in physics is only complete if we know its precision, that is to say if we have determined the uncertainty in the result. It must therefore be admitted that it is impossible to determine the true value. The measured value is only an approximate value of the true value.