The measurement

There is a simple ball. The ball is preciselly made from an alloy of a steel. What is its diameter **N**? For a simple way we use a ruler – imagine a projection method.

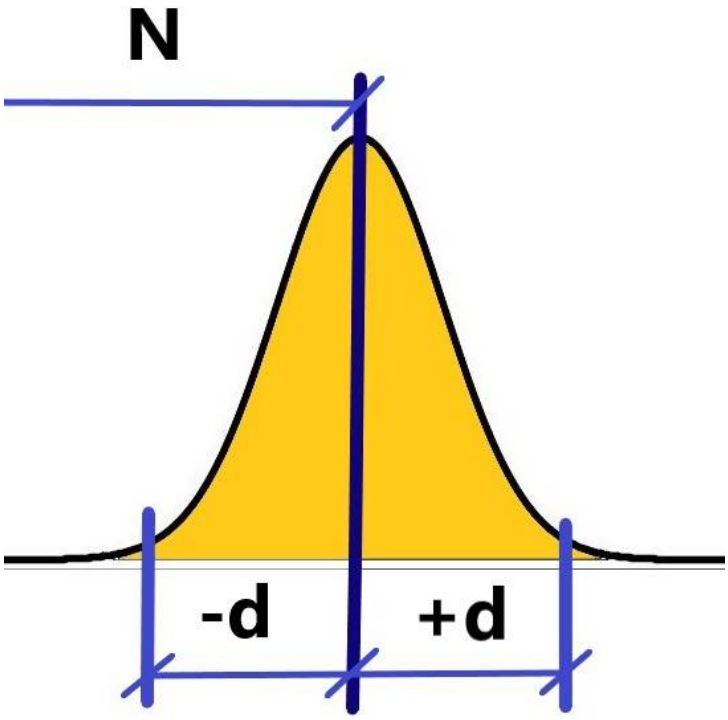

Fig. 1 – the tolerance **-d, +d** of measured diameter **N** of the ball

The measured value **N** depends on the resolving power of the ruler.
If the ruler has the scale made roughly then we obtain the same diameter. The more accurate ruler the more accurate measured value. If we use the optical intereferometry then every measured diameter will be different to each other. But nearly all measured values of the diameter **N** will be placed in a probabilistic range **N-d, N+d** from measured value **N**. **See Fig. 1.** We are be able to see thermal motion of molecules. The measured values oscillate. See flames like an example.

The accuracy of the measurement depends on a resolving power of a meter (ruler). *There is a limit of the resolving power. In the same way there is the limit of the measurement.*

What is the right value? Does the right value exist? No, it does not! It is only our solution from probability range of the curve of Gaussian distribution. We are only closely to right value more tightly. **We could say such value has**

an imaginary character for us. We are able only to solve the peak of the probabilistic curve and call that the right (or measured) value with some tolerance range.

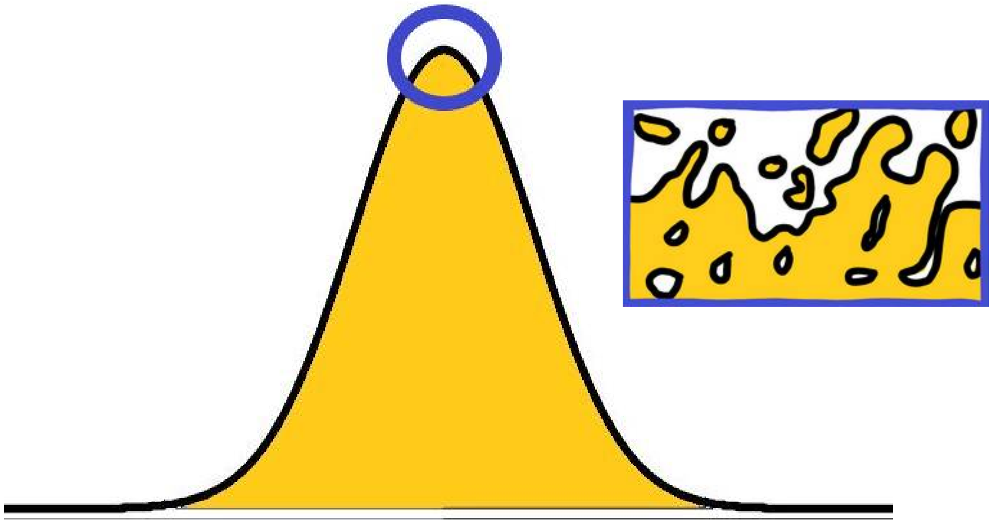

Fig. 2 – the peak of so called right (measured) value with detail of its fluctuations

There is no chance to reach the right value. **See Fig.2** For the reason it does not exist! Thermal motion or deeply the quantum foam of vacuum fluctuations. Only the unique oscillation around imaginary right value. **See irrational numbers – these are „oscillating" around undefinable value.** The last question is about suitable base unit which is taken out from such fluctuated objects. Why? We measure by one tolerance of the ruler the second tolerance of the measured object.

to be continued