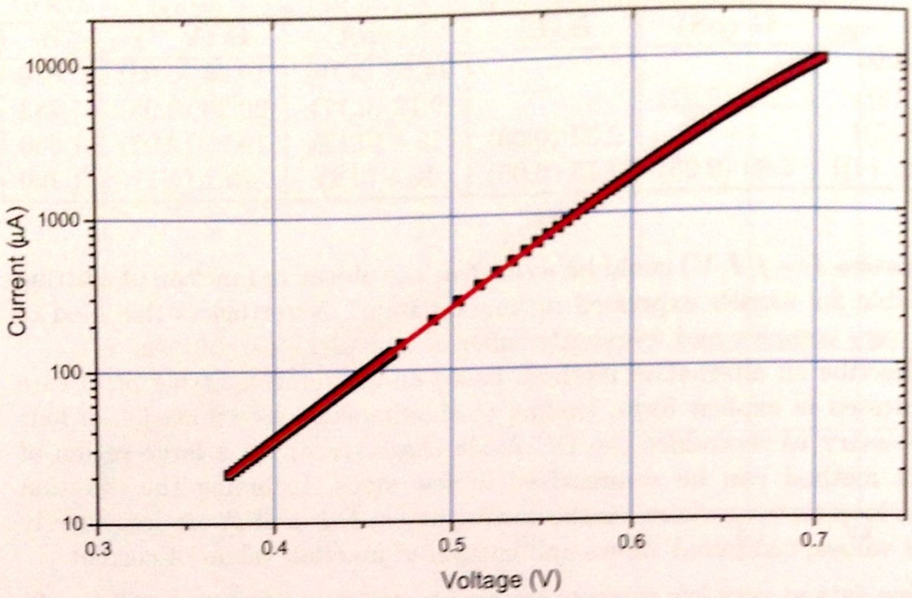

Figure 7. *I–V* data corresponding to the temperature $T = 47.8\,°C$ selected with $I > 20\,\mu A$. The continuous line is the result of the fit of experimental data (black square) with the model of eq. (7). The fitted parameters are $Is = 13.4 \pm 0.12\,nA$ and $B = 19.78 \pm 0.02\,V^{-1}$ and $R_s = 2.32 \pm 0.03\,\Omega$.

and it can be used as fit model for the *I–V* data at higher currents, giving the best values of the three parameters I_S, B and R_s. The result is shown in Fig. (7), and the found values for parameters are reported in the caption.

The values of the parameter B are approximately coincident, into few percent, in the two part of the curve and the coincidence is conserved by varying the value of I_0. The values of the saturation currents differ by the order of tens percent, and the agreement is better for higher temperature. The value of R_s is comparable with others measurement found in the literature [19], although there are data rather different from different sources (e.g. [17]). We were not able to find a reliable value of G for the 1N4148 diode in the literature.

In conclusion, the two sets of parameters obtained by fitting data with model eq. (5) for the region $I < I_0$ and with model eq. (7) for the region $I > I_0$, where I_0 is of the order of tens of μA, present some discrepancies, so a better analysis for the complete range of current is needed.

4.3. Single iterative fitting procedure

The analysis presented in the previous paragraph clearly show that the first term of eq. 4 is significant only in the very low current region (see Fig. (6)), while at higher currents the exponential term dominates and the second term alone is able to describe well experimental data (see Fig. (7)). This physical argument is the starting point of a numerical procedure which allow to consider all the data together, using an iterative calculation.

We point out that by substituting $I_J = I - GV$ in the argument of the exponential