from: Paul G.A. Jespers: "The gm/ID Methodology, A Sizing Tool for Low-voltage Analog CMOS Circuits", p. 158

A3.3 Temperature Dependence of E.K.V Parameters (MATLAB A33.m)

We showed in Chapter 4 that the basic E.K.V model is an approximation of the C.S.M. The acquisition method enabling to extract E.K.V parameters from C.S.M drain currents described in Section 4.5 offers the possibility consequently to assess the impact of the temperature of n, V_{To} and I_{Suo}. The plots of Fig. A3.3 show the influence of the temperature of the slope factor n, the threshold voltage V_{To} and the unary specific current I_{Su} when the temperature goes from 250 to 350 K. The threshold voltage, which is equal to 0.3984 V at 300 K, drops by 1.31 mV/°C, the slope factor, equal to 1.1267, increases by 8.2×10^{-5} per°C, and the unary specific current, equal to 4.44 × 10–7 A, decreases by 62.3 pA per°C.

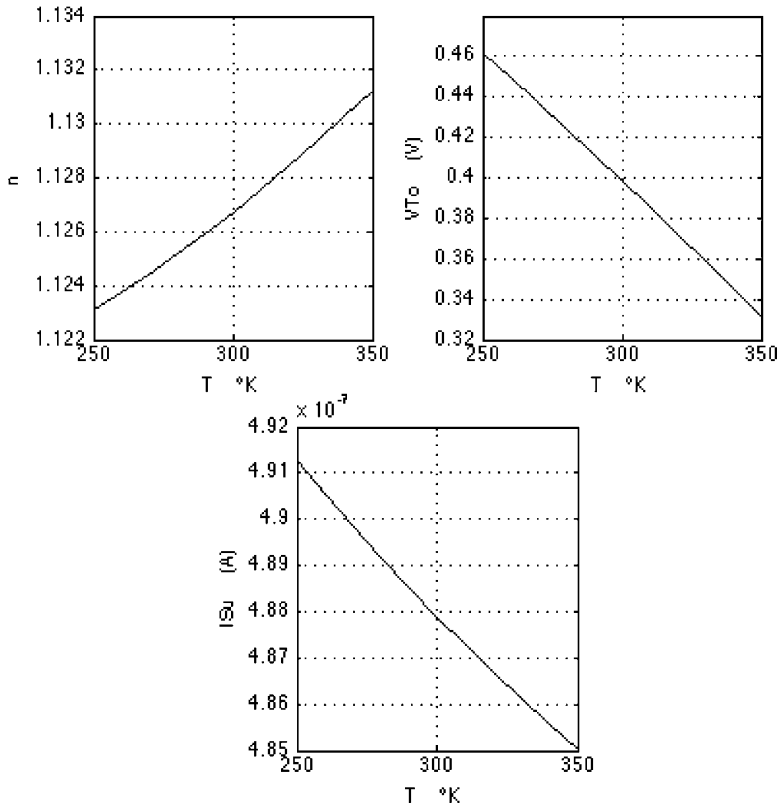

Fig. A3.3 influence of the temperature on the E.K.V parameters