Measurement of Hall and magnetoresistance mobility in the Si irradiated by electrons or by neutrons

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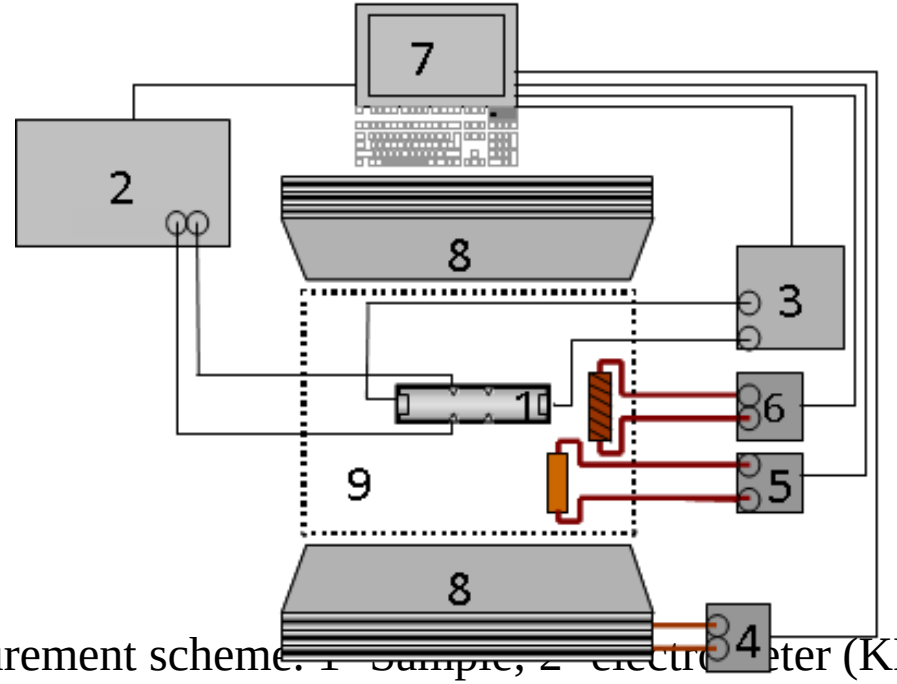


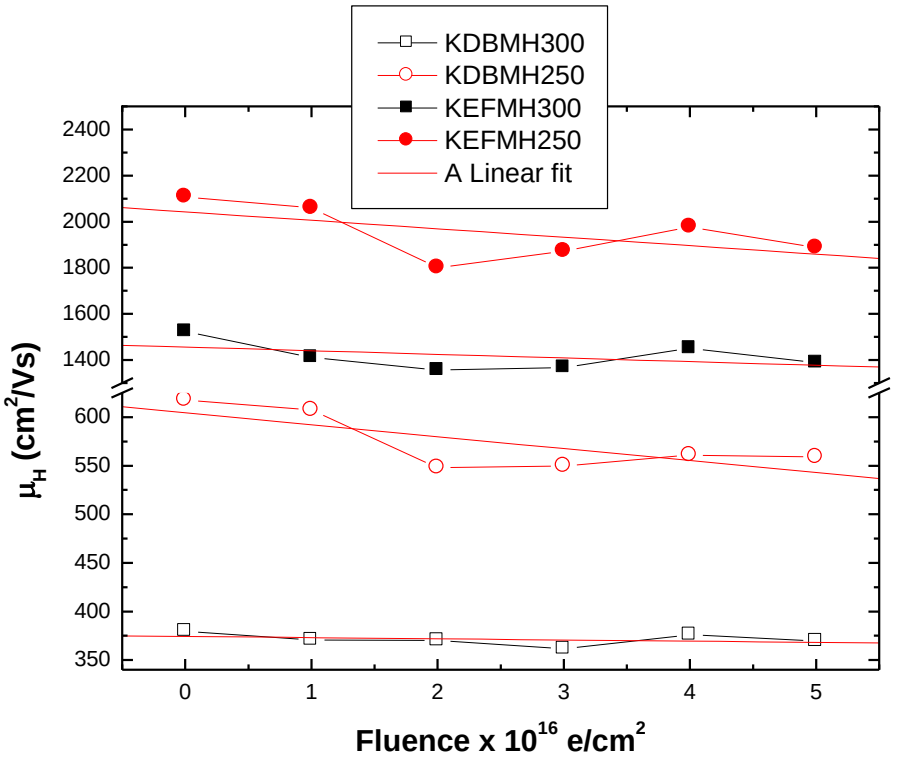
Hall effect measurement scheme: 1- sample, 2- electrometer (KEITHLEY 6514); 3- source meter (KEITHLEY 6430); 4- magnet source; 5- thermo resistance meter (Agilent 34401A); 6- heater source (TTi QL564P); 7- computer; 8- magnet; 9- cryostat.

$$\mu_H = r_H \mu, \; \mu_M = r_H \zeta \mu = r_M \mu.$$

It was found the ratio of magnetoresistance and Hall mobilities $\mu_M/\mu_H = 1.15$.

[A. Mekys, V. Rumbauskas, J. Storasta, L. Makarenko, N. Kazuchits, J.V. Vaitkus. Hall effect and magnetoresistance investigation of fast electron irradiated silicon. Lithuanian Journal of Physics, 54, 94–98 (2014)]. (And at last RD50 Workshop.)

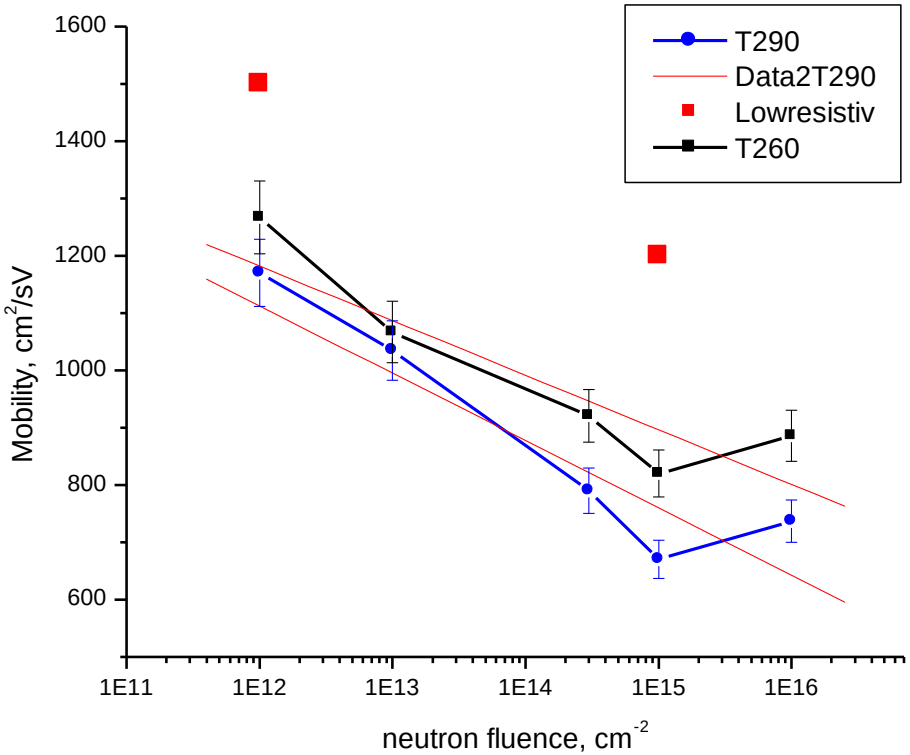
Electron irradiation (6,6 MeV, “low resistivity” Si)



A.Mekys, V.Rumbauskas, J.Storasta, L.Makarenko, J.V.Vaitkus. Defect analysis in fast electron irradiated silicon by Hall and magnetoresistivity means. Nuclear Instruments and Methods in Physics Research B338, 95-100 (2014)

Irrdiation by neutrons

(WODEAN samples & “Low resistivity”)



Magnetoresistance mobility: As $r_H = 0.15$, and $\mu_M/\mu_H = 1.15$, therfore $\mu_M \cong \mu$

More details and temperature dependence were presented in the earlier RD50 workshops

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THANK YOU

FOR YOUR ATTENTION!