same way the transitions $D^- \to D^+$ are also suppressed. Thus the resistance increases as a result of application of external magnetic field.

In our case of p-type structures the situation appears, again, more complicated due to more complex structure of $A^+$ centers. However, in general, the considerations given in [9], [10] still hold. Basing on the calculations similar to given in [10] one obtains for weak field limit $\mu g H < T$ the following estimate:

$$\ln \frac{R(H)}{R(0)} = CF \left( \frac{g\mu_b H}{T} \right)^2 \tag{32}$$

where $C \sim 1/3$,

$$F = \frac{2g_l g_u}{(g_l + g_u)^2} \tag{33}$$

while $g_l$, $g_u$ are the densities of states of the lower and upper Hubbard bands. Note that for the low concentration of dopants $g_u$ is controlled by the concentration of $A^+$ centers while $g_l$ - by the concentration of $A^-$ centers and thus $g_l = g_u$. At stronger magnetic fields when $\mu g H > T$, the corresponding contribution to magnetoresistance still increases with magnetic field increase until $\mu g H$ reaches the value $\xi T$ and then saturates [9], [10].

One notes that at low enough temperatures the positive magnetoresistance of the spin nature suggested in [9] can exceed the wave shrinkage magnetoresistance. At the same time this contribution at relatively weak fields when $\mu g H < T$ is expected to be comparable to the spin magnetoresistance resulting from interference term discussed above. Summarizing the both spin contributions to quadratic magnetoresistance we estimate the coefficient $k$ resulting from the similar parametrization of the positive quadratic and linear negative magnetoresistance as was done above:

$$\begin{aligned} k_2 &= g_M E_B r_{min}^{1/2} r_h 2a^{1/2}\beta \qquad \text{Mott} \quad \text{law} \\ k_2 &= \frac{\kappa^2}{e^4} E_B^2 r_{min} r_h^{1/2} 2a^{1/2}\beta \qquad \text{ES} \quad \text{law} \\ \beta &= P(H=0)\frac{T}{g\mu_B}\frac{r_h^{3/2}a^{1/2}e}{c\hbar}(CF + \alpha\frac{\Delta R_{sat}}{R(0)})^{-1/2} \end{aligned} \tag{34}$$

Thus, as it is seen, for the Mott case at $T \to 0$ $k \propto T^{1/3}$ while for the ES case it is $\propto T^{1/4}$.

Note that in our calculations we assumed that the value of $H_{min}$ still corresponds to linear behavior of negative magnetoresistance which means that the magnetic flux through the interference area is much less than magnetic flux quantum $\Phi_0$. The critical field $H_{sat}$