PRESENTATION OF THE PROXIMITY FUNCTION BY THREE PARAMETERS α, β, η BASED ON MONTE CARLO METHOD AND COMPARISON WITH THE EXPERIMENT

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The paper presents a program for modeling electron scattering in layered materials. Calculations show that the absorbed energy density is three-dimensional, while the contribution of the forward-scattered electrons is better described by a power function rather than the commonly used Gaussian. It is shown that for practical correction of the proximity effect, it is possible, nevertheless, to use the classical two-dimensional proximity function containing three parameters α, β, η. Good agreement of the obtained parameters and experimental data for various substrates and electron energies is shown. Thus, a method for calculating the parameters of the classical proximity function for arbitrary layered substrates based on Monte Carlo simulation has been developed.

Table 4. Comparison experimental proximity parameters β_e, η_e with calculated effective parameters for Ge и diamond. PMMA thickness 0.5um,

Substrate	Ge				C (diamond)			
Density	5323 кг/м^3				3500 кг/м^3			
E, keV	β_e	β_s	η_e	η_s	β_e	β_s	η_e	η_s
11	-	0.73	-	1.26	0.7	0.79	-	0.51
15	0.7	0.92	-	1.28	1.0	1.08	-	0.41
20	1.1	1.15	-	1.24	1.6	1.61	-	0.33
25	1.4	1.46	1.1	1.18	2.1	2.23	0.45	0.3
30	1.8	1.84	-	1.12	2.6	2.96	-	0.29
35	2.5	2.27	-	1.08	3.6	3.87	-	0.26
39	-	2.67	-	1.06	-	4.63	-	0.25