with the classical choice of Bmin and Bmax, here we calculate

$$\int_{B_{min}}^{B_{max}} u(t, x_i + y)k(y)d(y) \tag{1}$$

as

$$\int_{B_{min}+x_i}^{B_{max}+x_i} u(t, z)k(z - x_i)d(z) \tag{2}$$

using the variable change $z = x + y$.