1 First integral (1)

$$\int_0^1 d\alpha\{\alpha^a(1-\alpha)^b\}\int_0^\infty dt\{\frac{t^m}{(1+t)^n}F[z_0]\} \equiv I(a,b,m,n;F[z_0]) \tag{1}$$

$$F[z_0] = exp[-2z_0] \tag{2}$$

$$z_0 = tD + \frac{t}{1+t}R^2 \tag{3}$$

$$D = \alpha_1(b_1^2P^2 + m_1^2) + \alpha_2(b_2^2P^2 + m_2^2) \tag{4}$$

$$R^2 = \alpha_1^2b_1^2 + \alpha_2^2b_2^2 + 2\alpha_1\alpha_2(m_1m_2) \tag{5}$$

$$b_1 = -\frac{m_1}{m_1+m_2} \tag{6}$$

$$b_2 = \frac{m_1}{m_1+m_2} \tag{7}$$

1.1 Integral (1.1)

$$\int_0^1 d\alpha\{\alpha^a(1-\alpha)^b\} \tag{8}$$

Function is:

$$\alpha^a(1-\alpha)^b \tag{9}$$

and functions variants are:

1.1.1 Function

$$\alpha^a(1-\alpha)^b, a=1, b=1 \tag{10}$$

1.1.2 Function

$$\alpha^a(1-\alpha)^b, a=0, b=1 \tag{11}$$

1.1.3 Function

$$\alpha^a(1-\alpha)^b, a=1, b=0. \tag{12}$$

1.2 Integral (1.2)

$$\int_0^\infty dt\{\frac{t^m}{(1+t)^n}F[z_0]\} \tag{13}$$

Function is:

$$\frac{t^m}{(1+t)^n}F[z_0] \tag{14}$$

and subfunctions are:

$$\frac{t^m}{(1+t)^n} \tag{15}$$

and

$$F[z_0] \tag{16}$$

and functions variants are:

1.2.1 Function

$$\frac{t^m}{(1+t)^n}, m = 2, n = 2 \tag{17}$$

1.2.2 Function

$$\frac{t^m}{(1+t)^n}, m = 3, n = 3 \tag{18}$$

1.2.3 Function

$$\frac{t^m}{(1+t)^n}, m = 4, n = 4 \tag{19}$$

1.2.4 Function

$$\frac{t^m}{(1+t)^n}, m = 2, n = 3 \tag{20}$$

1.2.5 Function

$$F[z_0], \alpha_1 = \alpha_2 = 2.4, m_1 = m_2 = 0.7083333, P^2 = -1.665046. \tag{21}$$