From these conditions we fix completely the two parameters to $\alpha = -1$ and $\beta = 0$ so that the mass function (in the $y \leq 0$ region) becomes:

$$m(y) = m_0 \, \frac{y}{y-1} \tag{15}$$

The most general condition that we can impose on the term multiplying to $1/[y(1-y)]$ in order that the equation be that of the hypergeometric function is that it be equal to a constant γ. Therefore we get three equations:

$$\begin{aligned} \mu^2 + \frac{E^2}{a^2} + \frac{W^2}{a^2} - 2\frac{EW}{a^2} - \mu - \frac{i}{a}(E-W) = &\quad 0 && \text{(16a)} \\ -2\frac{E^2}{a^2} + 2\frac{EW}{a^2} - i\frac{W-E}{a} - 2\mu^2 - (\lambda - \mu) = &\quad \gamma && \text{(16b)} \\ \mu^2 + \lambda(1+\lambda) + \frac{E^2 - m_0^2}{a^2} = &\; -\gamma && \text{(16c)} \end{aligned}$$

From Eq. (16a), it is possible to solve for μ while λ is found summing Eq. (16b) and Eq. (16c). We obtain finally:

$$\begin{aligned} \lambda &= i\sqrt{\frac{W^2 - m_0^2}{a^2}} && \text{(17a)} \\ \mu &= -i\,\frac{(E-W)}{a} && \text{(17b)} \\ \gamma &= \nu^2 - \mu^2 - \lambda(\lambda+1) && \text{(17c)} \end{aligned}$$

having defined $\nu = ik/a$ where $k^2 = E^2 - m_0^2$. Our Eq. (13) becomes the differential equation of the hypergeometric function

$$y(1-y)\frac{d^2 f(y)}{dy^2} + [2\mu - (1 + 2\mu - 2\lambda)y]\frac{d\,f(y)}{dy} - (\mu - \lambda - \nu)(\mu - \lambda + \nu)f = 0, \tag{18}$$

and the general solution is (with D_1 and D_2 constants):

$$f(y) = D_1\, {}_2F_1(\mu-\nu-\lambda, \mu+\nu-\lambda; 2\mu; y) + D_2\, y^{1-2\mu}\, {}_2F_1(1-\mu-\nu-\lambda, 1-\mu+\nu-\lambda; 2-2\mu; y)\,. \tag{19}$$