The integral that I want to solve is

$$I = P \int_0^{\frac{1}{2m_p}} \frac{1}{m_p s}\sqrt{(1-2m_p^2u^2)^2 - 4m_p^4u^4}\left[\frac{4A_2m_p^2u^{2N_2+1} - 2A_2u^{2N_2-1} + (2s-4m_p^2)uC_2\ln^\gamma(\frac{1}{u^2})}{(2m_p^2u^2-1)}\frac{1}{(u^2-\frac{1}{s})(1-4m_p^2u^2+su^2)}\right]du$$

Where P is the Cauchy principal value. If I say that the second term of the denominator es equal to

$$\left(u^2 - \frac{1}{s}\right) = \left(u - \sqrt{\frac{1}{s}}\right)\left(u + \sqrt{\frac{1}{s}}\right)$$

The pole is when $u = \sqrt{\frac{1}{s}}$.

With the parameters values that appears in the program, this is the unique pole that belong to intervale from 0 to $\frac{1}{2m_p}$