Exploring the system

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Discussion

$$H_i^0\left(\frac{g_i}{m_i}-1\right)-S\mu\,\bar{H}=(1-\mu)H_i$$

$$H_i^0\left(\frac{g_i}{m_i}-1\right)=(1+S\mu-\mu)\,\bar{H}$$

$$(1-\mu)H_i=H_i^0\left(\frac{g_i}{m_i}-1\right)-\frac{\mu}{1+S\mu-1}\sum_j H_j^0\left(\frac{g_j}{m_j}-1\right)$$

Plugging in g_i on both sides and knowing that $\mathrm{NPP}=\sum_i g_i H_i$. We get:

$$(1-\mu)\,\mathrm{NPP}=\sum_i\left[m_i H_i^0\left(\frac{g_i^2}{m_i^2}-\frac{g_i}{m_i}\right)\right]-\frac{\mu}{1+S\mu-1}\sum_i\sum_j\left[m_i H_i^0\left(\frac{g_i g_j}{m_i m_j}-\frac{g_i}{m_i}\right)\frac{H_i^0}{H_j^0}\right]$$

Define:

$$(*)=m_i H_i^0\left(\frac{g_i^2}{m_i^2}-\frac{g_i}{m_i}\right)$$

$$(1-\mu)\,\mathrm{NPP}=(1-\frac{\mu}{1+S\mu-1})\sum_i(*)-\frac{\mu}{1+S\mu-1}\sum_{i,j}m_i H_i^0\left(\frac{g_i g_j}{m_i m_j}-\frac{g_i}{m_i}\right)\frac{H_i^0}{H_j^0}$$

Or what is the same:

$$(1-\mu)\,\mathrm{NPP}=(1-\frac{\mu}{1+S\mu-1})\sum_i(*)-\frac{\mu}{1+S\mu-1}\frac{g_j}{m_j}H_i^0 m_i\sum_{i,j}\left(\frac{g_j}{m_j}-1\right)\frac{H_i^0}{H_j^0}$$

Assuming $\sum_i Sp_i=1$, then $\sum p_i\,\mathrm{NPP}$ is equal to NPP, where p is a vector.

Finally, with no competition ($\mu=0$), we have:

$$\frac{g_i}{m_i}=1+\sqrt{\frac{4p_i\,\mathrm{NPP}}{F_i}}$$

So you need:

$$p_i\,\mathrm{NPP}>\frac{F_i}{4}\text{ where }F_i=m_i H_i^0$$

Continuation