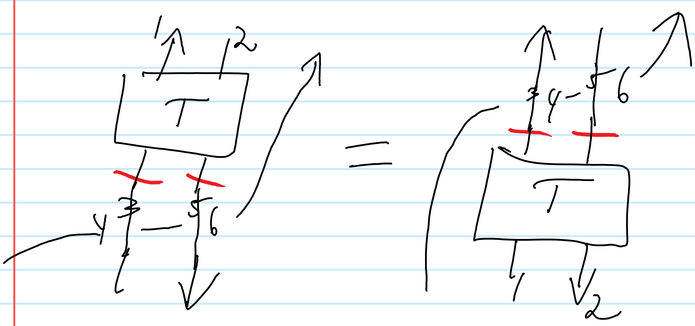
Fox-Milnor Assuming Unitarity

July-04-15 7:17 PM

Aside: The underslide:



$\xi_T R^-_{34} R^+_{56}$ //

$m_0^{46} // m_1^{31} // m_2^{25}$

$m_0^{46} // m_1^{13} // m_2^{52}$

In[19]:= {ξ Rm34 Rp56 // m46→0 // m31→1 // m25→2, ξ Rm34 Rp56 // m46→0 // m13→1 // m52→2}

Out[19]=
$$\left\{\begin{pmatrix}\omega & h_0 & h_1 & h_2\\ t_0 & \frac{T_2}{T_1} & 0 & 0\\ t_1 & -\frac{(-1+\gamma)(-1+T_1)}{T_1} & 1-\gamma & \beta\\ t_2 & \frac{1-\gamma+\gamma T_1-T_2}{T_1} & \gamma & 1-\beta\end{pmatrix},\ \begin{pmatrix}\omega & h_0 & h_1 & h_2\\ t_0 & \frac{T_2}{T_1} & 0 & 0\\ t_1 & \frac{-1+\beta+T_1-\beta T_2}{T_1} & 1-\gamma & \beta\\ t_2 & \frac{(-1+\beta)(-1+T_2)}{T_1} & \gamma & 1-\beta\end{pmatrix}\right\}$$

$$\left\{-\frac{(-1+\gamma)(-1+T_1)}{T_1} == \frac{-1+\beta+T_1-\beta T_2}{T_1},\ \frac{1-\gamma+\gamma T_1-T_2}{T_1} == \frac{(-1+\beta)(-1+T_2)}{T_1}\right\} //$$
Simplify

Out[29]=
$$\left\{\frac{\beta-\gamma+\gamma T_1-\beta T_2}{T_1} == 0,\ \frac{\beta-\gamma+\gamma T_1-\beta T_2}{T_1} == 0\right\}$$

So $(1-T_2)\beta+(T_1-1)\gamma=0$ or

$(1-T_2)\beta=(1-T_1)\gamma$ or $\gamma=\frac{1-T_2}{1-T_1}\beta$

$$\text{Eigenvalues}\left[\begin{pmatrix}\frac{1}{1-\gamma} & \frac{\beta}{1-\gamma}\\ \frac{\gamma}{-1+\gamma} & \frac{-1+\beta+\gamma}{-1+\gamma}\end{pmatrix}\right]$$

$$\left\{\frac{-1+\beta}{-1+\gamma},\ 1\right\}$$

In[13]:=
$$\left\{\xi=\Gamma\left[\omega,\ \{t_1,t_2\}.\begin{pmatrix}1-\gamma & \beta\\ \gamma & 1-\beta\end{pmatrix}.\{h_1,h_2\}\right],\ \xi // tr_1,\ \xi // m_{12\to1}\right\}$$

Out[13]=
$$\left\{\begin{pmatrix}\omega & h_1 & h_2\\ t_1 & 1-\gamma & \beta\\ t_2 & \gamma & 1-\beta\end{pmatrix},\ \begin{pmatrix}\gamma\,\omega & h_2\\ t_2 & 1\end{pmatrix},\ \begin{pmatrix}\omega-\beta\,\omega & h_1\\ t_1 & 1\end{pmatrix}\right\}$$

A tangle $\begin{pmatrix}1-\gamma & \beta\\ \gamma & 1-\beta\end{pmatrix}$ is such that ds^2 of

it is unitary, so $\frac{\beta-1}{\gamma-1}\cdot\frac{\bar\beta-1}{\bar\gamma-1}=1$

So $(\beta-1)(\bar{\beta}-1) = (\gamma-1)(\gamma-1)$

We also know that $\gamma w = \cancel{1}0$.

What can we say about $(1-\beta)w$?

$$(1-\beta)w = \cancel{\frac{1-\beta}{\gamma} = \frac{1-T_1}{1-T_2}\,\frac{1-\beta}{\beta}}$$