n – počet proměnných  CERN 4. 9. 2015

m – míry asymptotiky

ak $n > m$

$$F_{1s}^{N}(t) = F_0 \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} + \sum_{k=m+1}^{n} \left\{ \sum_{i=1}^{m} \frac{m_k^2}{(m_k^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_k^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_k$$

$m = 2$

$n = \omega'', \phi'', \omega', \phi', \omega, \phi$

$$\Rightarrow F_{1s}^{N}(t) = \frac{1}{2} \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} + \left\{ \sum_{i=1}^{m} \frac{m_{\omega'}^2}{(m_{\omega'}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\omega'}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_{\omega'} +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\phi'}^2}{(m_{\phi'}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\phi'}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_{\phi'} +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\omega}^2}{(m_{\omega}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\omega}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_{\omega} +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\phi}^2}{(m_{\phi}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\phi}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_{\phi}$$

$$F_{1s}^{N}(t) = \frac{1}{2} \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} +$$

$$+ \left\{ \frac{m_{\omega'}^2 m_{\phi''}^2}{(m_{\omega'}^2 - t)(m_{\phi''}^2 - t)} \frac{(m_{\phi''}^2 - m_{\omega'}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)} + \frac{m_{\omega'}^2 m_{\omega''}^2}{(m_{\omega'}^2 - t)(m_{\omega''}^2 - t)} \frac{(m_{\omega''}^2 - m_{\omega'}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} \right\} (f_{\omega' NN}^{(1)} | f_{\omega'})$$

$$+ \left\{ \frac{m_{\phi'}^2 m_{\phi''}^2}{(m_{\phi'}^2 - t)(m_{\phi''}^2 - t)} \frac{(m_{\phi''}^2 - m_{\phi'}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)} + \frac{m_{\phi'}^2 m_{\omega''}^2}{(m_{\phi'}^2 - t)(m_{\omega''}^2 - t)} \frac{(m_{\omega''}^2 - m_{\phi'}^2)}{(m_{\omega''} - m_{\phi''}^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} \right\} (f_{\phi' NN}^{(1)} | f_{\phi'})$$

$$+ \left\{ \frac{m_{\omega}^2 m_{\phi''}^2}{(m_{\omega}^2 - t)(m_{\phi''}^2 - t)} \frac{(m_{\phi''}^2 - m_{\omega}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)} + \frac{m_{\omega}^2 m_{\omega''}^2}{(m_{\omega}^2 - t)(m_{\omega''}^2 - t)} \frac{(m_{\omega''}^2 - m_{\omega}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} \right\} (f_{\omega NN}^{(1)} | f_{\omega})$$

$$+ \left\{ \frac{m_{\phi}^2 m_{\phi''}^2}{(m_{\phi}^2 - t)(m_{\phi''}^2 - t)} \frac{(m_{\phi''}^2 - m_{\phi}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)} + \frac{m_{\phi}^2 m_{\omega''}^2}{(m_{\phi}^2 - t)(m_{\omega''}^2 - t)} \frac{(m_{\omega''}^2 - m_{\phi}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)} \right\} (f_{\phi NN}^{(1)} | f_{\phi})$$

$n$ - počet rezonancí

$m$ - určuje asymptotiku

Ak $n > m$

$$\Rightarrow \quad F_{1V}^{N}(t) = F_0 \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} + \sum_{k=m+1}^{n} \left\{ \sum_{i=1}^{m} \frac{m_k^2}{(m_k^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_k^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} a_k$$

$m = 2$

$n = \rho'', \rho', \rho$

$$\Rightarrow \quad F_{1V}^{N}(t) = \frac{1}{2} \frac{m_{\rho''}^2 m_{\rho'}^2}{(m_{\rho''}^2 - t)(m_{\rho'}^2 - t)} + \left\{ \sum_{i=1}^{m} \frac{m_\rho^2}{(m_\rho^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_\rho^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} (f_{\rho NN}^{(1)} / f_\rho$$

$$F_{1V}^{N}(t) = \frac{1}{2} \frac{m_{\rho''}^2 m_{\rho'}^2}{(m_{\rho''}^2 - t)(m_{\rho'}^2 - t)} +$$

$$+ \left\{ \frac{m_\rho^2 m_{\rho'}^2}{(m_\rho^2 - t)(m_{\rho'}^2 - t)} \frac{(m_{\rho'}^2 - m_\rho^2)}{(m_{\rho'}^2 - m_{\rho''}^2)} + \frac{m_\rho^2 m_{\rho''}^2}{(m_\rho^2 - t)(m_{\rho''}^2 - t)} \frac{(m_{\rho''}^2 - m_\rho^2)}{(m_{\rho''}^2 - m_{\rho'}^2)} - \frac{m_{\rho''}^2 m_{\rho'}^2}{(m_{\rho''}^2 - t)(m_{\rho'}^2 - t)} \right\} (f_{\rho NN}^{(1)} / f_\rho$$

$n$ – počet rezonancí

$m$ – určuje asymptotiku

Ak $n > m$

$$\Rightarrow F_{2S}^{N}(t) = F_0 \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} + \sum_{k=m+1}^{n} \left\{ \sum_{i=1}^{m} \frac{m_k^2}{(m_k^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_k^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{\prod_{j=1}^{m} m_j^2}{\prod_{j=1}^{m}(m_j^2 - t)} \right\} \text{ak}$$

$m = 3$

$n = \omega'', \phi'', \omega', \phi', \omega, \phi$

$$\Rightarrow F_{2S}^{N}(t) = \frac{1}{2}(\mu_p + \mu_n - 1) \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\phi'}^2}{(m_{\phi'}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\phi'}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\phi' NN}^{(2)} / f_{\phi'} \right) +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\omega}^2}{(m_{\omega}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\omega}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\omega NN}^{(2)} / f_{\omega} \right) +$$

$$+ \left\{ \sum_{i=1}^{m} \frac{m_{\phi}^2}{(m_{\phi}^2 - t)} \frac{\prod_{j\neq i}^{m} m_j^2}{\prod_{j\neq i}^{m}(m_j^2 - t)} \frac{\prod_{j\neq i}^{m}(m_j^2 - m_{\phi}^2)}{\prod_{j\neq i}^{m}(m_j^2 - m_i^2)} - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\phi NN}^{(2)} / f_{\phi} \right)$$

$$F_{2S}^{N}(t) = \frac{1}{2}(\mu_p + \mu_n - 1) \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} +$$

$$+ \left\{ \frac{m_{\phi'}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\phi'}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\phi''}^2 - m_{\phi'}^2)(m_{\omega'}^2 - m_{\phi'}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)(m_{\omega'}^2 - m_{\omega''}^2)} + \frac{m_{\phi'}^2 m_{\omega''}^2 m_{\omega'}^2}{(m_{\phi'}^2 - t)(m_{\omega''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\omega''}^2 - m_{\phi'}^2)(m_{\omega'}^2 - m_{\phi'}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)(m_{\omega'}^2 - m_{\phi''}^2)} - \right.$$

$$\left. - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\phi' NN}^{(2)} / f_{\phi'} \right) +$$

$$+ \left\{ \frac{m_{\omega}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\phi''}^2 - m_{\omega}^2)(m_{\omega'}^2 - m_{\omega}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)(m_{\omega'}^2 - m_{\omega''}^2)} + \frac{m_{\omega}^2 m_{\omega''}^2 m_{\omega'}^2}{(m_{\omega}^2 - t)(m_{\omega''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\omega''}^2 - m_{\omega}^2)(m_{\omega'}^2 - m_{\omega}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)(m_{\omega'}^2 - m_{\phi''}^2)} - \right.$$

$$\left. - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\omega NN}^{(2)} / f_{\omega} \right) +$$

$$+ \left\{ \frac{m_{\phi}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\phi}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\phi''}^2 - m_{\phi}^2)(m_{\omega'}^2 - m_{\phi}^2)}{(m_{\phi''}^2 - m_{\omega''}^2)(m_{\omega'}^2 - m_{\omega''}^2)} + \frac{m_{\phi}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\phi}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \frac{(m_{\omega''}^2 - m_{\phi}^2)(m_{\omega'}^2 - m_{\phi}^2)}{(m_{\omega''}^2 - m_{\phi''}^2)(m_{\omega'}^2 - m_{\phi''}^2)} - \right.$$

$$\left. - \frac{m_{\omega''}^2 m_{\phi''}^2 m_{\omega'}^2}{(m_{\omega''}^2 - t)(m_{\phi''}^2 - t)(m_{\omega'}^2 - t)} \right\} \left( f_{\phi NN}^{(2)} / f_{\phi} \right)$$

$n$ - pole rezonanc

$m$ - určuje asymptotiku

Ak $n = m = 3$

$n = \rho'', \rho', \rho$

$$\Rightarrow \boxed{\overline{F}_{2V}^{N}(t) = \frac{1}{2}(\mu_p + \mu_n - 1)\,\frac{m_{\rho''}^2\, m_{\rho'}^2\, m_{\rho}^2}{(m_{\rho''}^2 - t)(m_{\rho'}^2 - t)(m_{\rho}^2 - t)}}$$