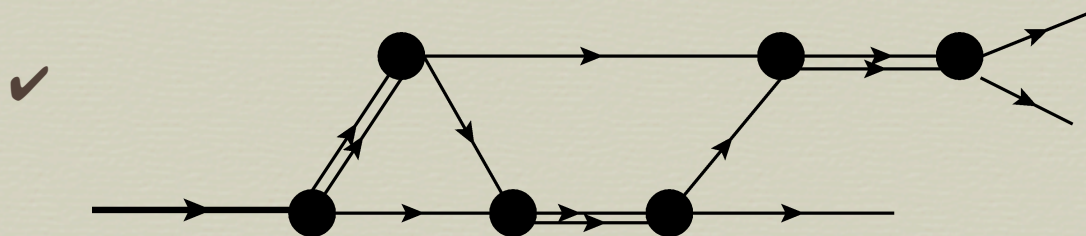


Dispersive analysis of $\omega \rightarrow 3\pi$



✓ $\text{Disc } F(s) = \rho(s) t^*(s) (F(s) + \hat{F}(s))$

$$\hat{F}(s) = 3 \int_{t^-(s)}^{t^+(s)} \frac{dt}{k(s)} (1 - z_s^2) F(t)$$

✓ $t(s)$ is the $\pi\pi$ scattering amplitude

B. Kubis et.al. [Niecknig:2012sj]

✓ elastic unitarity

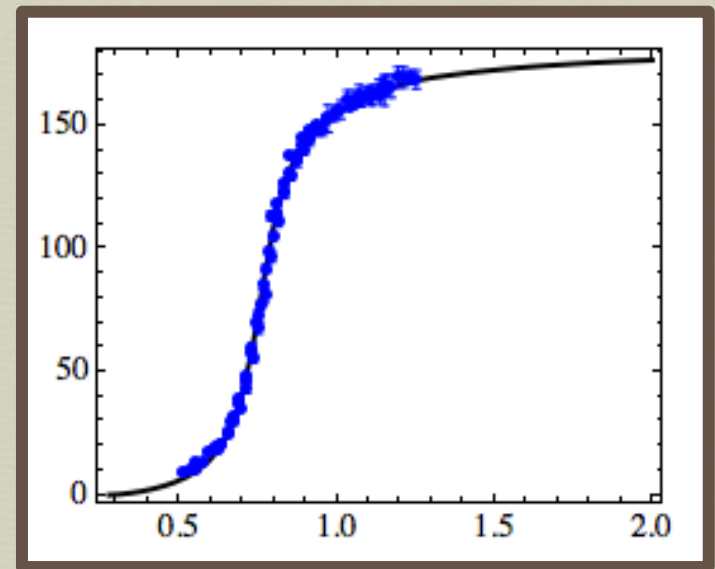
✓ $F(s) = \Omega(s) g(s)$

✓ $\Omega(s) = \exp \left(\frac{s}{\pi} \int_{4m_\pi^2}^{\infty} \frac{ds'}{s'} \frac{\delta(s')}{s' - s} \right)$

✓ assume $\delta(s \rightarrow \infty) \rightarrow \pi$

✓ $F(s) = \Omega(s) \left(\sum_{i=0}^{n-1} \alpha_i s^i + \frac{s^n}{\pi} \int_{4m_\pi^2}^{\Lambda^2} \frac{ds'}{s'^n} \frac{\sin(\delta(s')) \hat{F}(s')}{|\Omega(s')|(s' - s)} \right)$

$\Lambda = 1.9 \text{ GeV}$



Our way

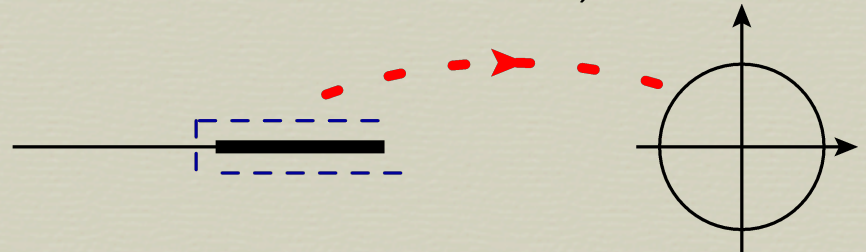
$$✓ F(s) = \Omega'(s) \left(G(s) + \sum_{i=0}^n a_i \omega^i \right)$$

$$✓ \Omega'(s) = \frac{\Omega_{el}(s)}{(4m_K^2 - s)^{\delta(s)/\pi}}, \quad \Omega_{el}(s) = \exp \left(\frac{s}{\pi} \int_{4m_\pi^2}^{4m_K^2} \frac{ds'}{s'} \frac{\delta(s')}{s' - s} \right)$$

✓ no assumption about $\delta(s \rightarrow \infty)$

$$✓ F(s) = \Omega'(s) \left(\int_{4m_\pi^2}^{4m_K^2} \frac{ds'}{\pi} \frac{\sin \delta(s')}{|\Omega'(s')|} \frac{\hat{F}(s')}{s' - s} + \sum_{i=0}^n a_i \omega^i \right)$$

✓ $\omega(s)$ is a conformal map of inelastic contributions



It took us some time to find it...

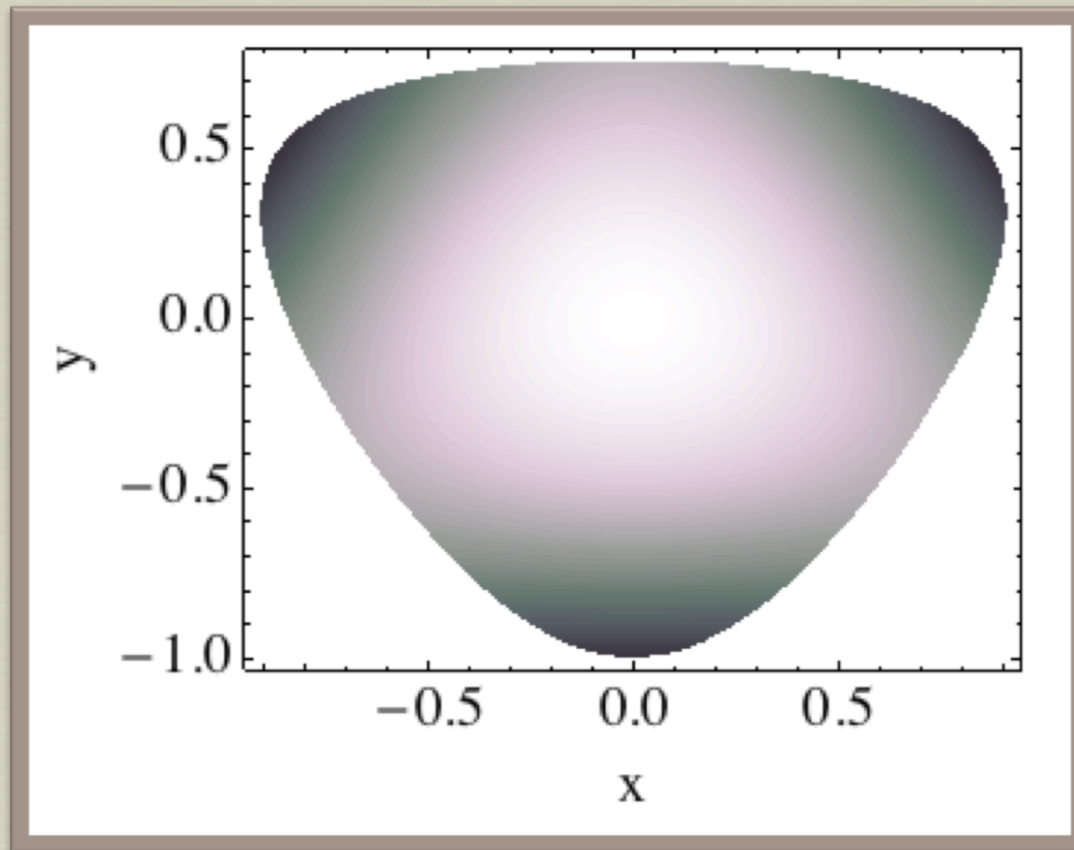
✗ $F(s) = t(s)(G(s) + \sum a_i \omega^i)$ need to neglect l.h. cuts
 $F(s) = t(s)G(s) + \sum a_i \omega^i$ in Disc $G(s)$

≈ $F(s) = \int_{4m_\pi^2}^{4m_K^2} \frac{ds'}{\pi} \frac{\text{Disc } F(s)}{s' - s} + \sum a_i \omega^i$ - problems with a cut-off
- an additional integral [homogeneous part]

✓ $F(s) = \Omega'(s)G(s) + \sum a_i \omega^i$

✓ ✓ $F(s) = \Omega'(s)(G(s) + \sum a_i \omega^i)$

Numerical results (omega)



Numerical results (phi)

