



**Petersburg Nuclear Physics Institute**  
**Meson Physics Laboratory**



Доклад на семинаре ОФВЭ

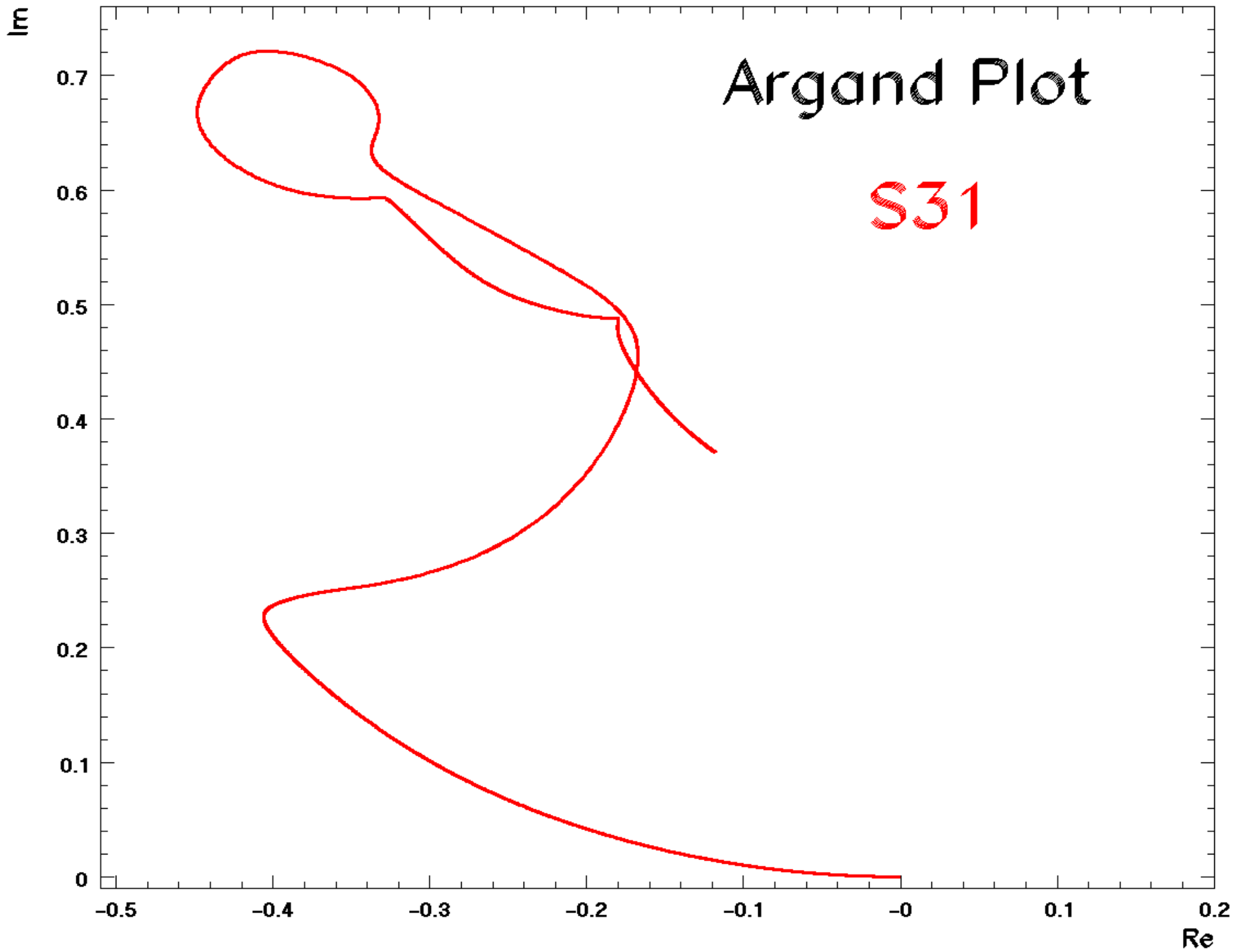
Абаев В.В.

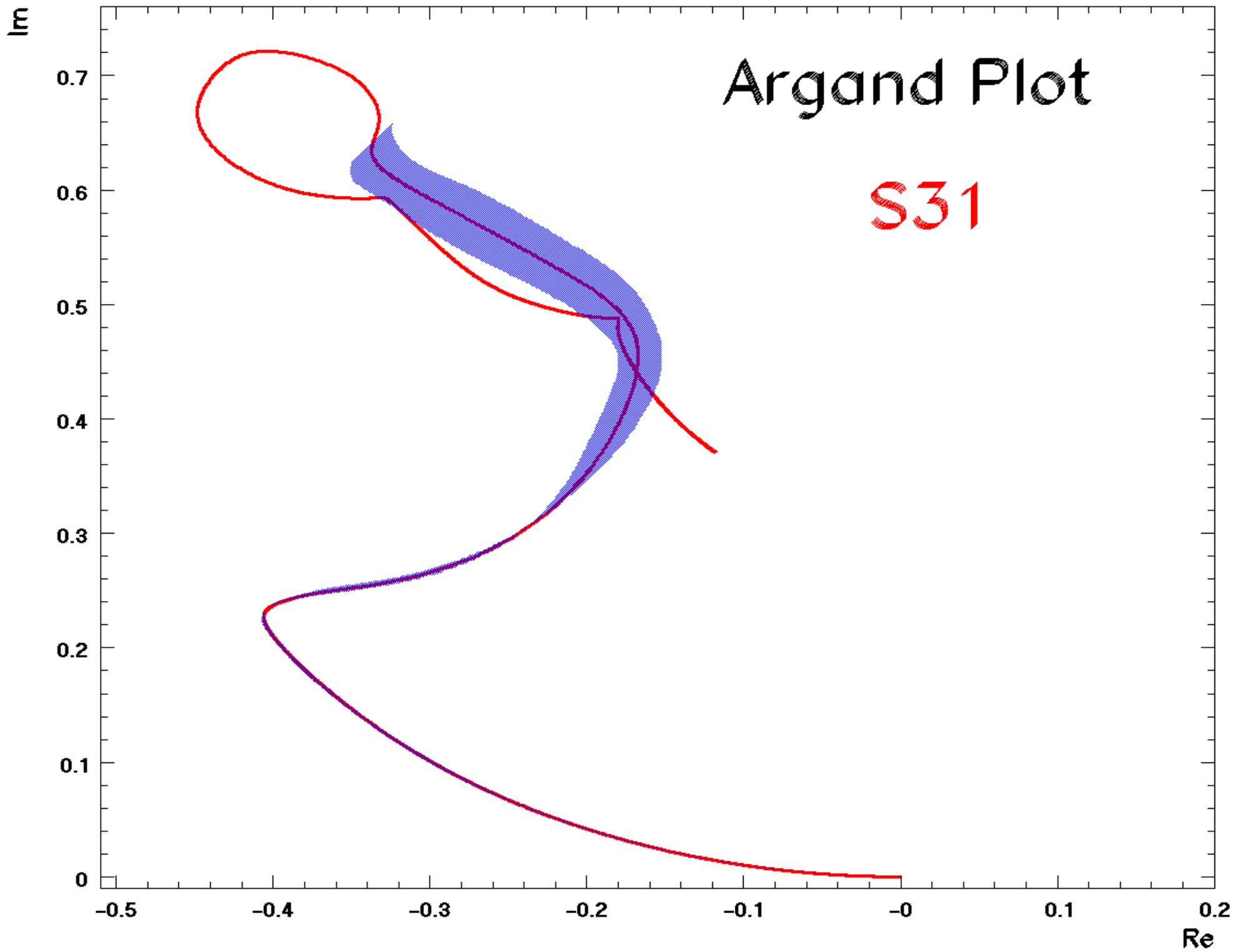
**S31** длина рассеяния

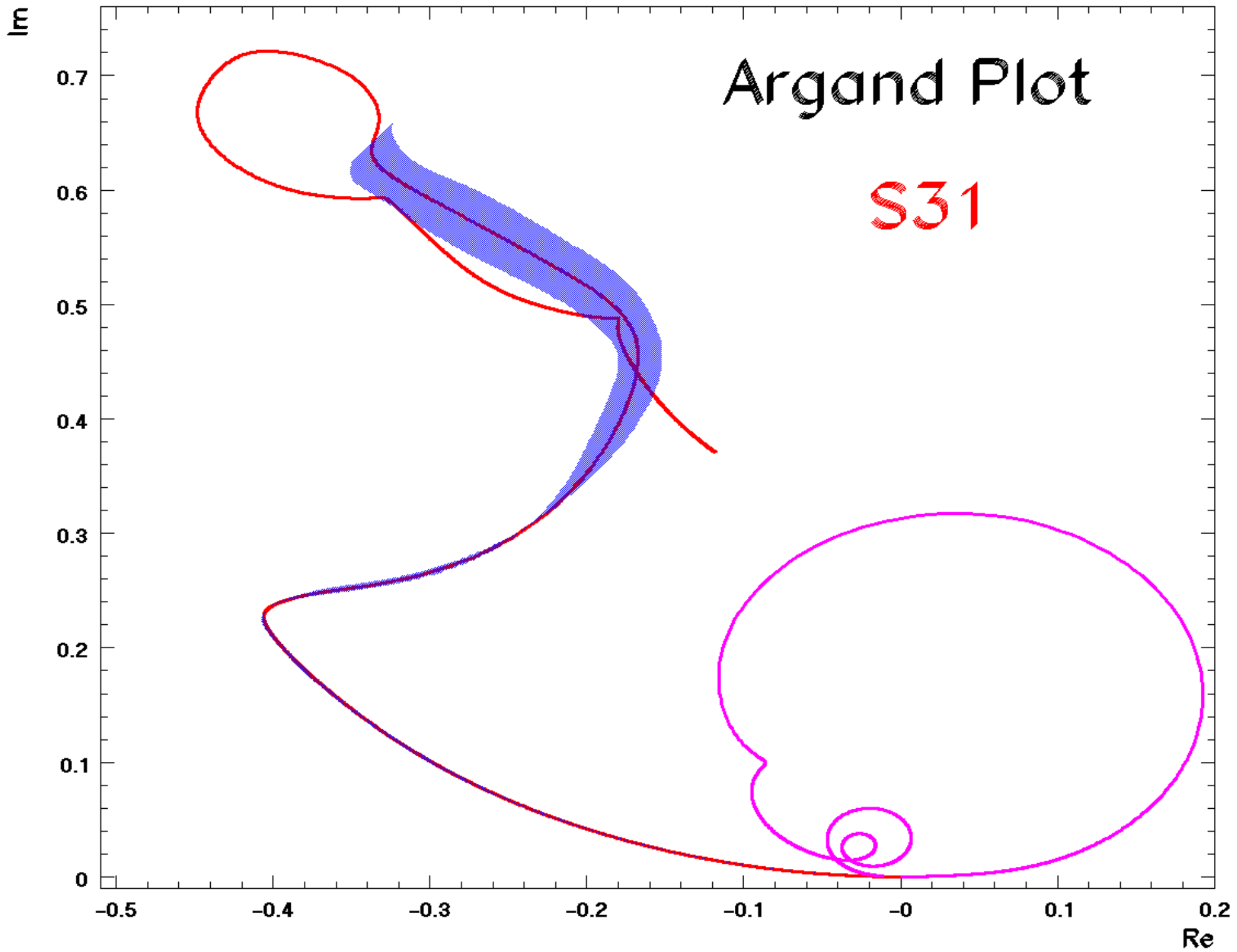
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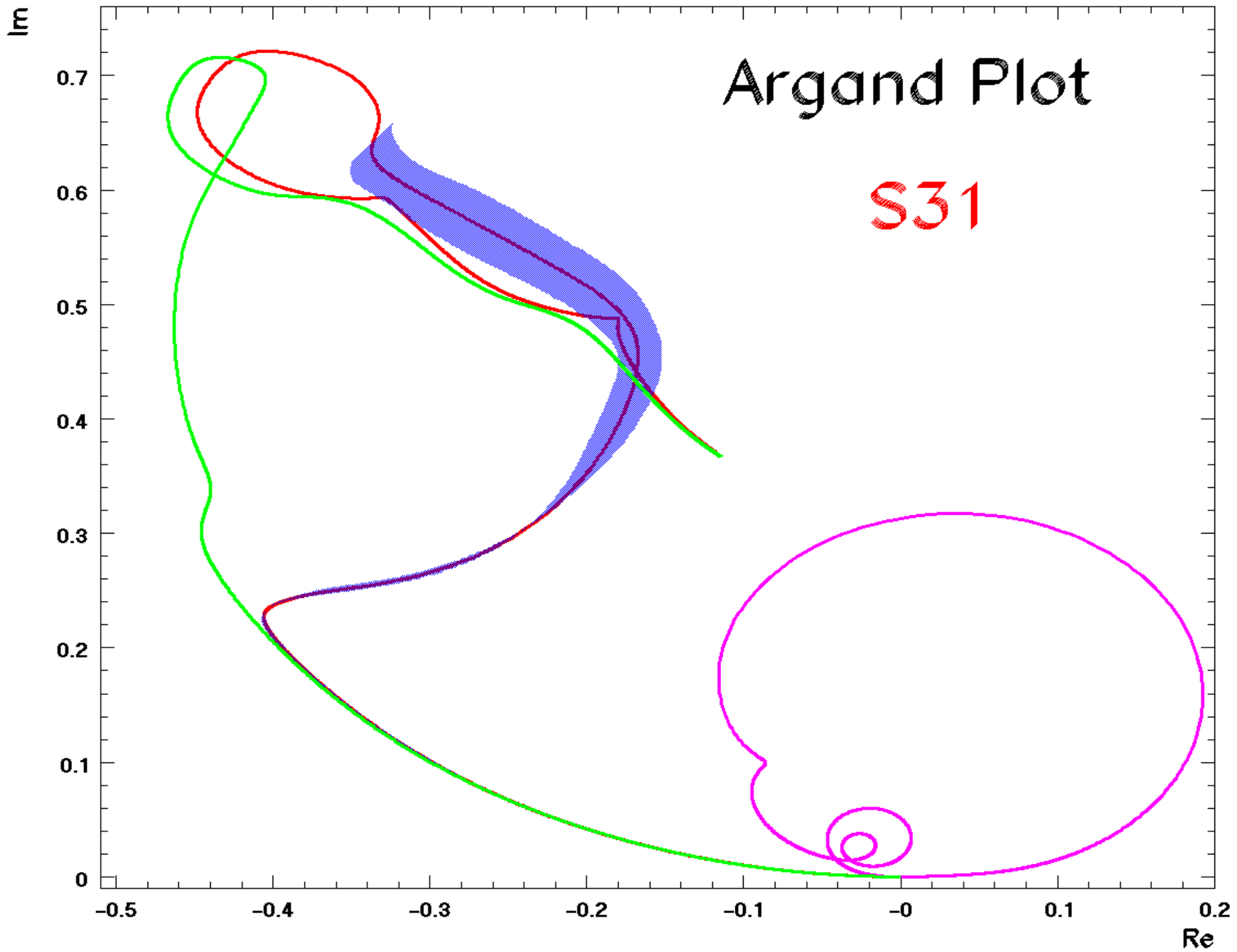
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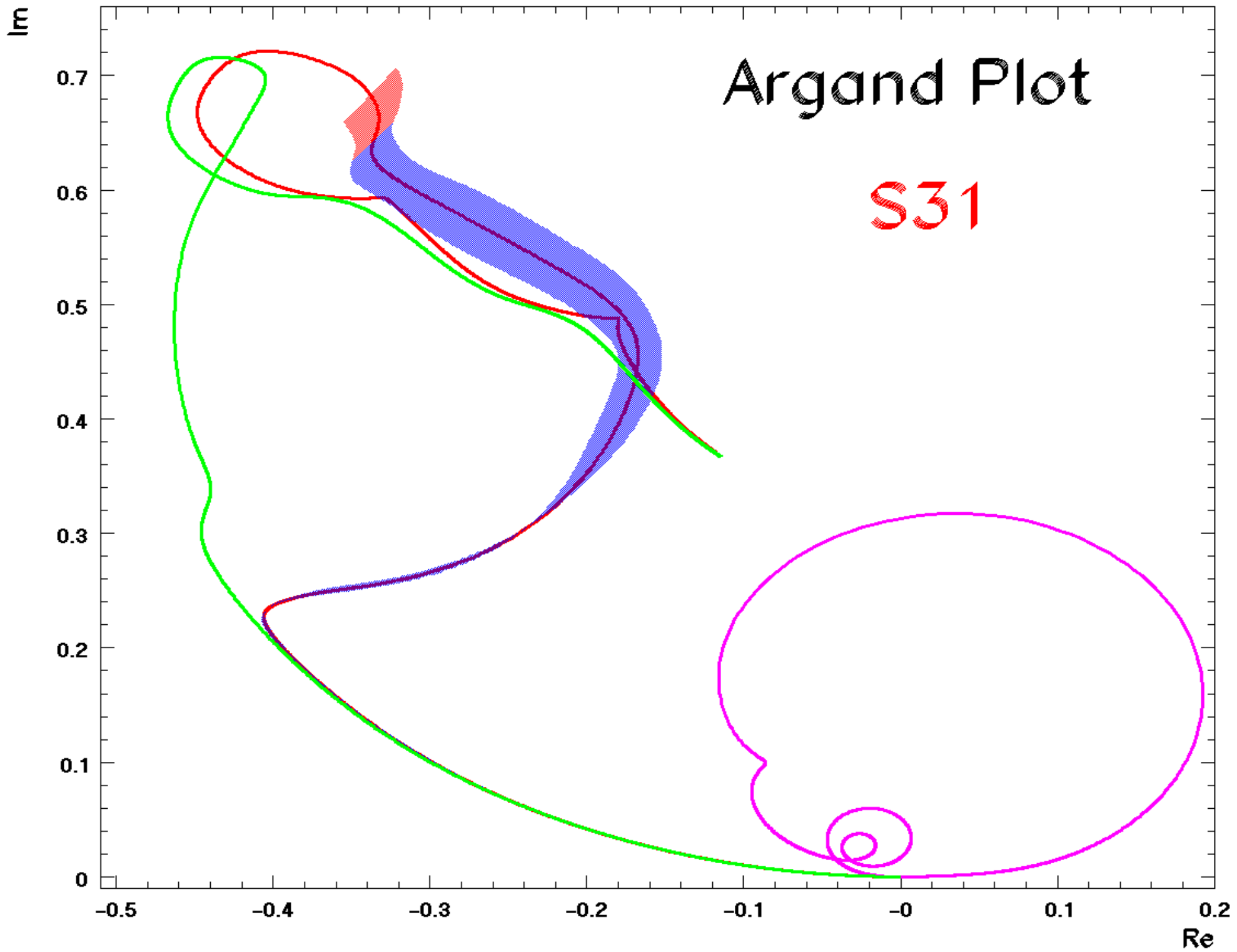
Фазовые Анализы

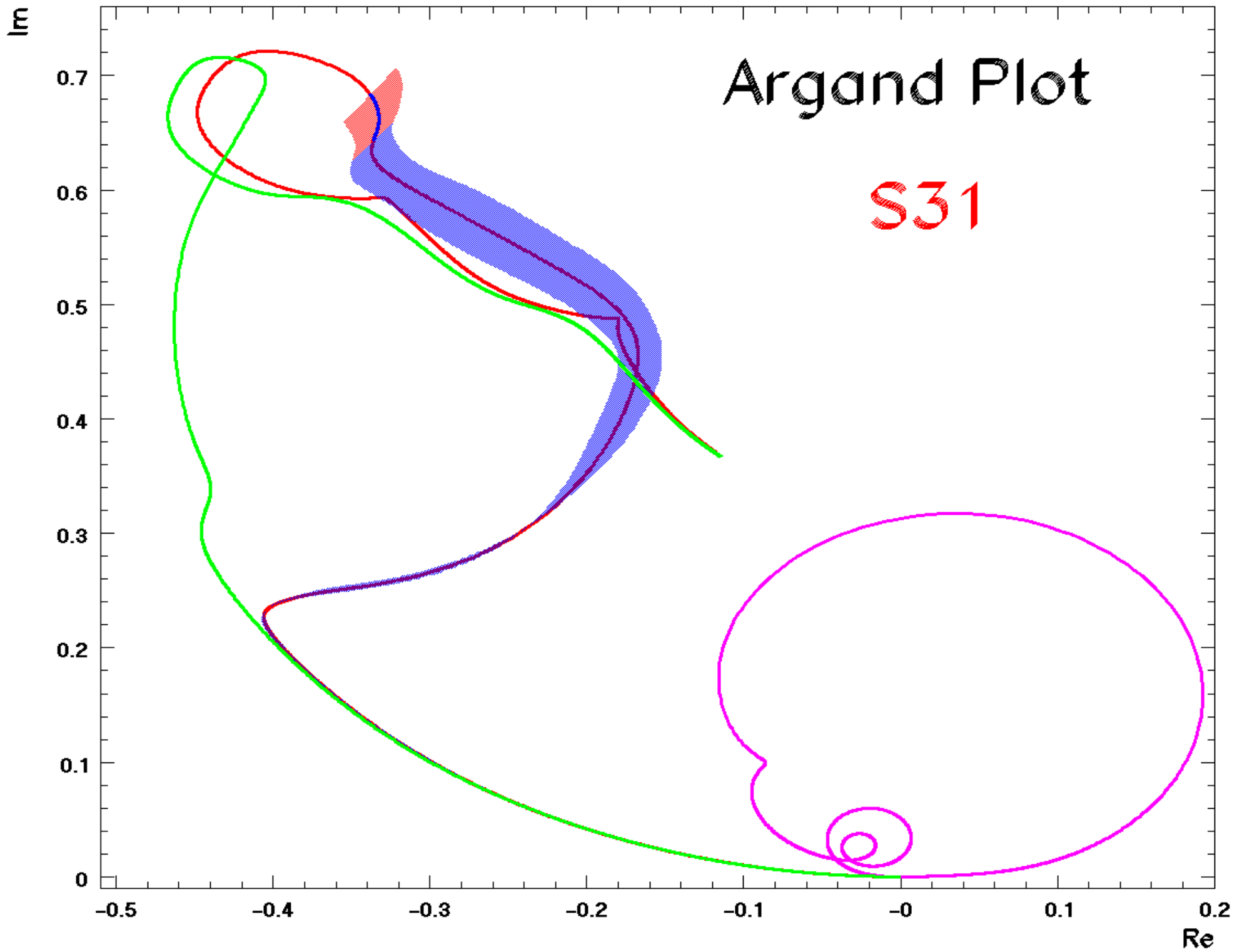




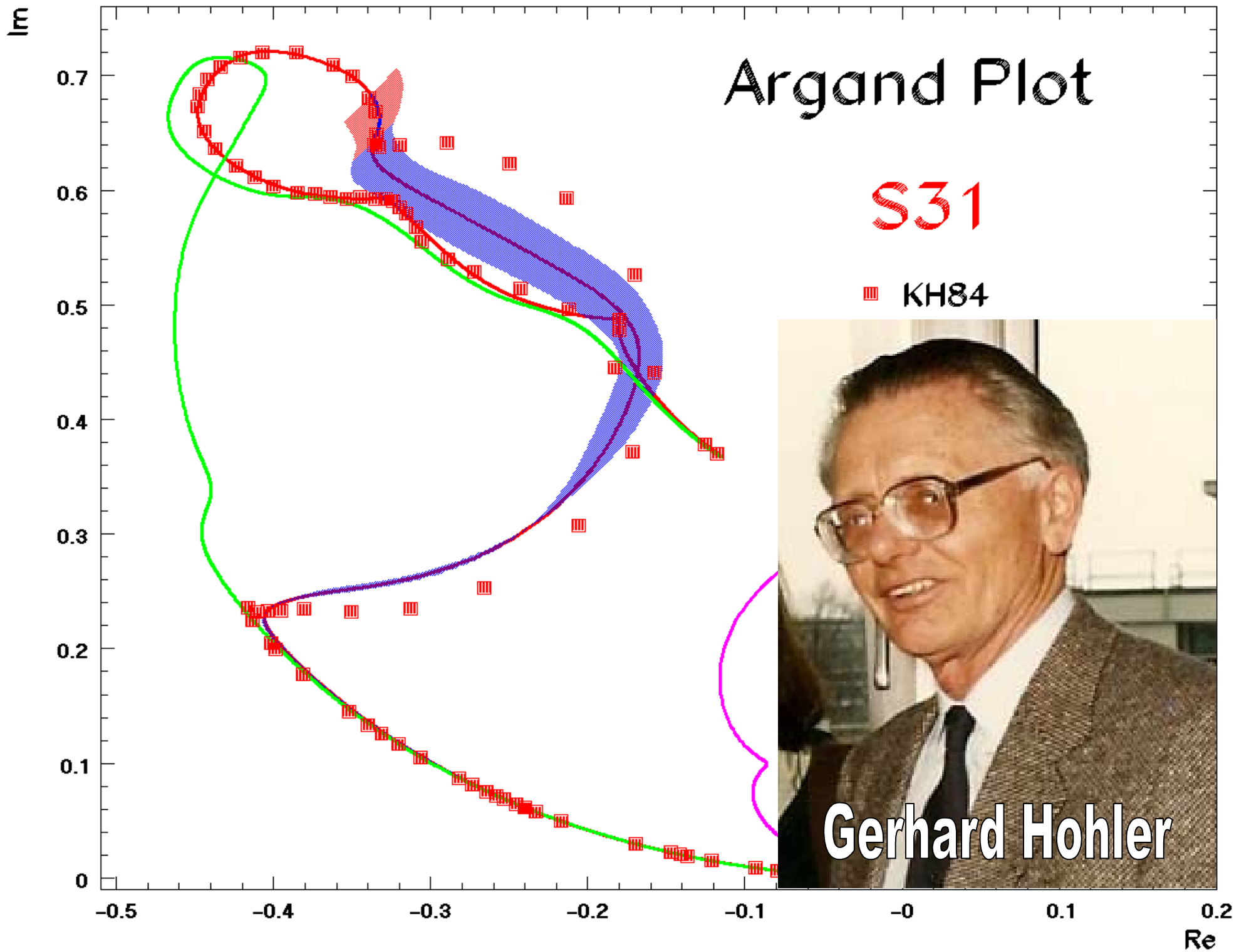


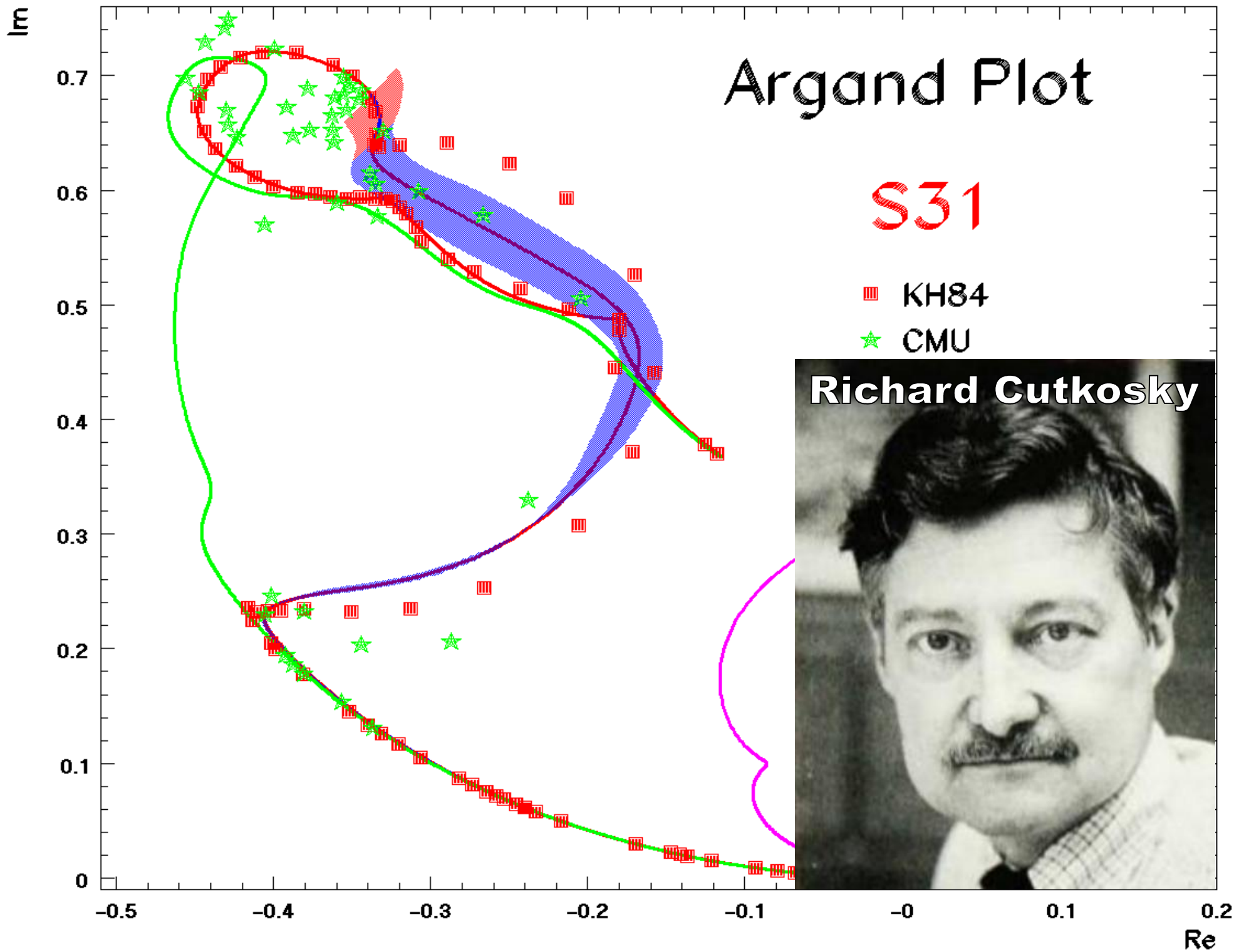


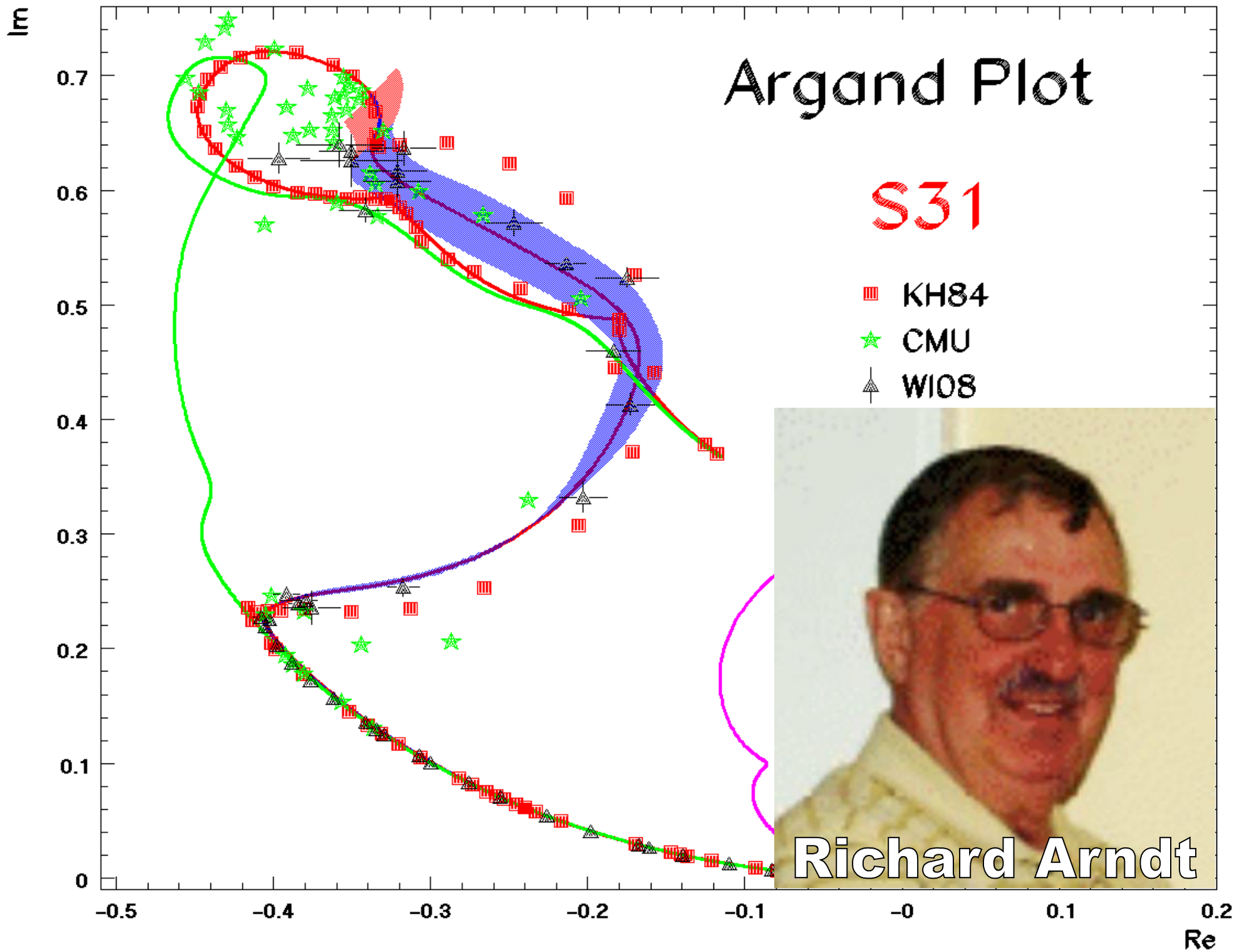


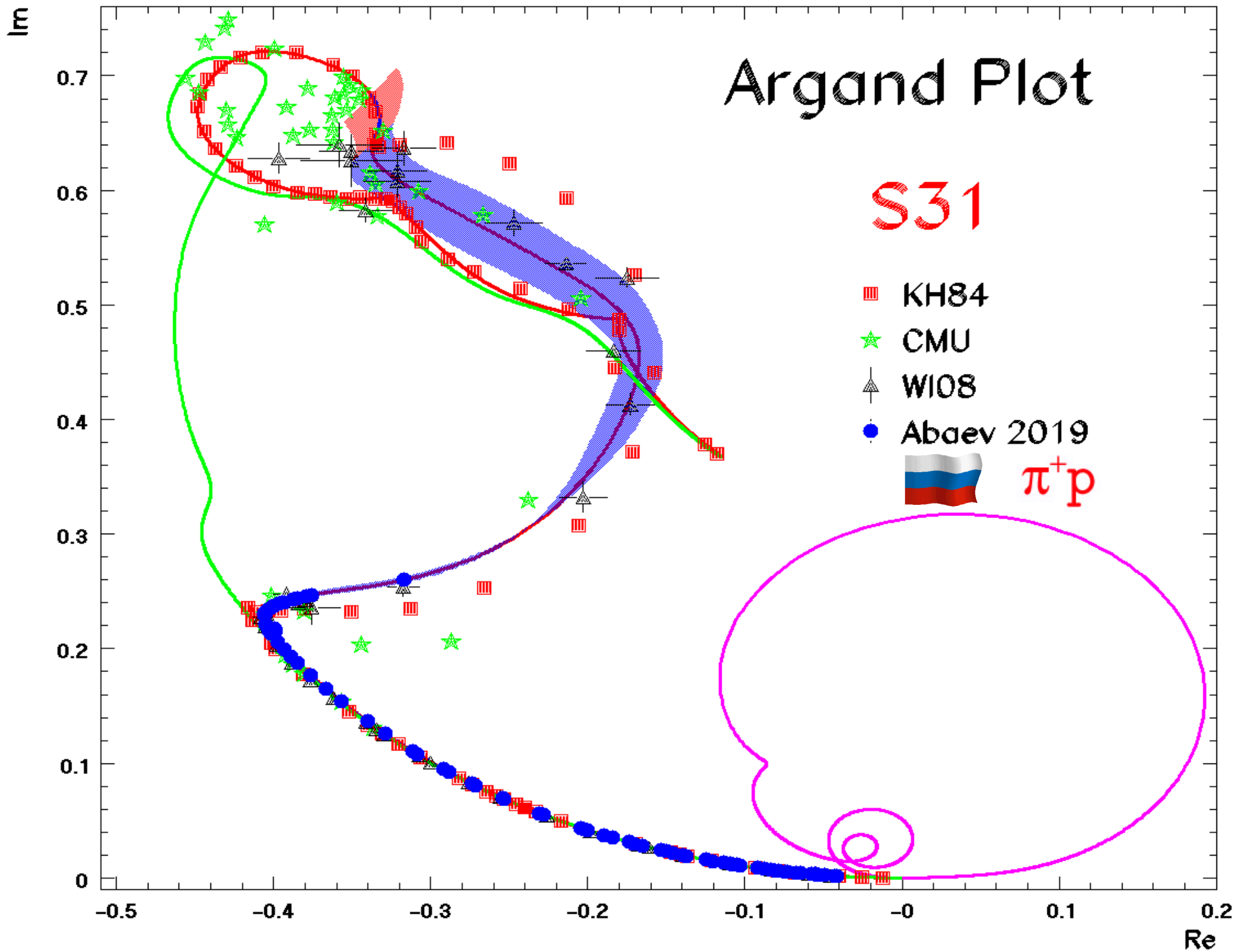


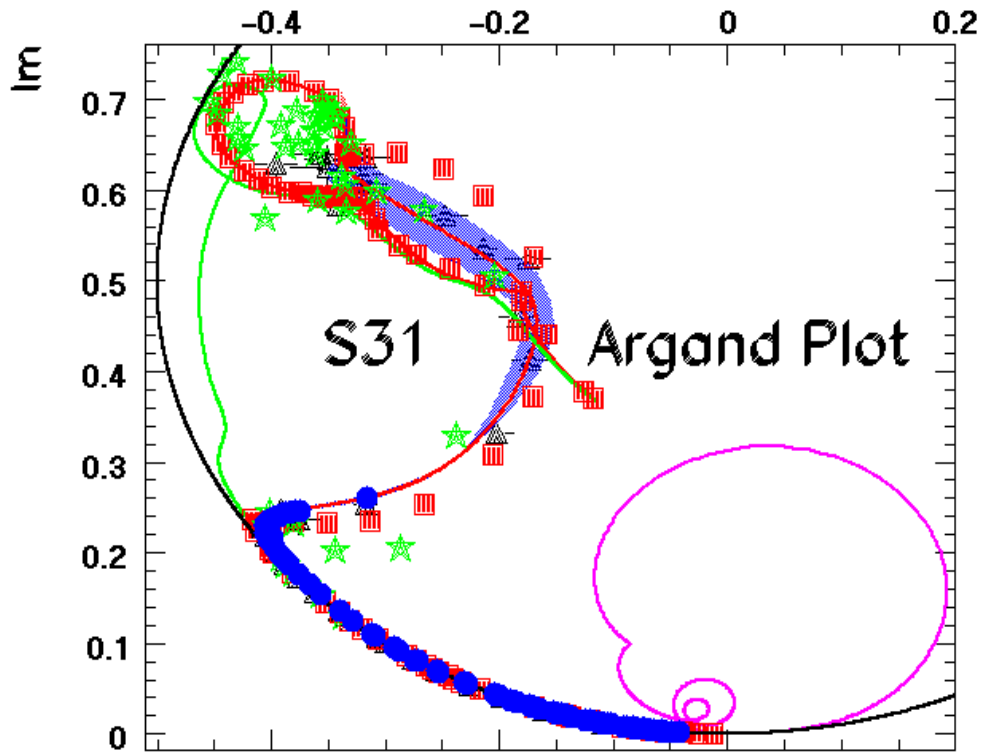


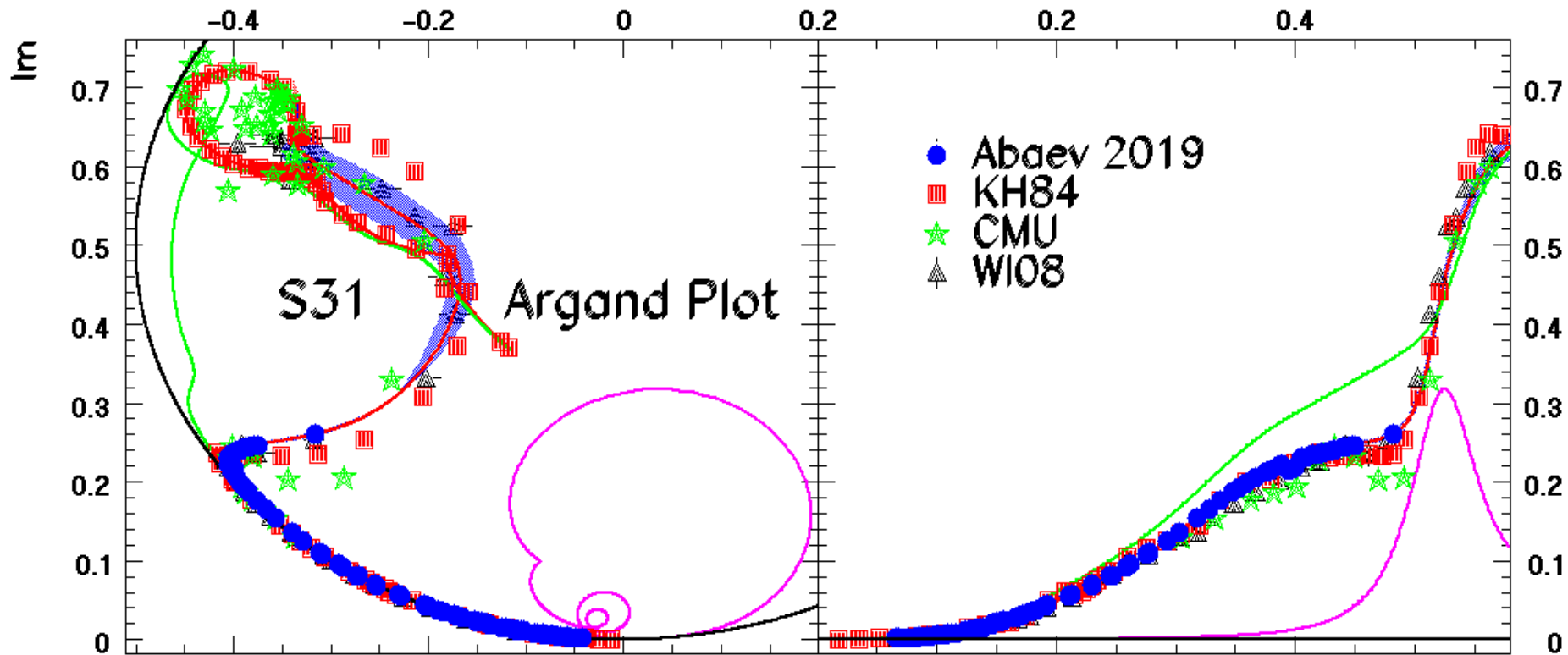


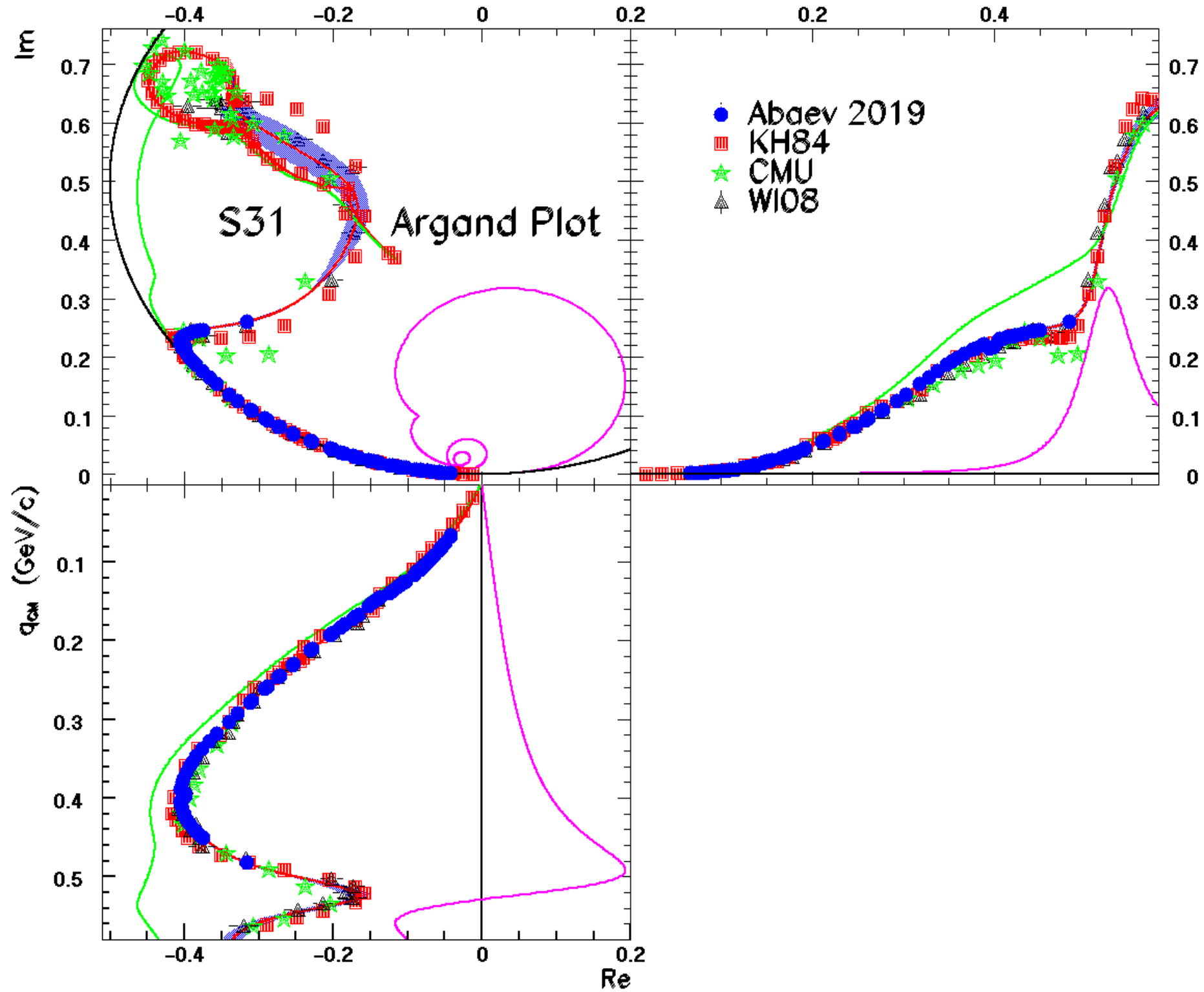


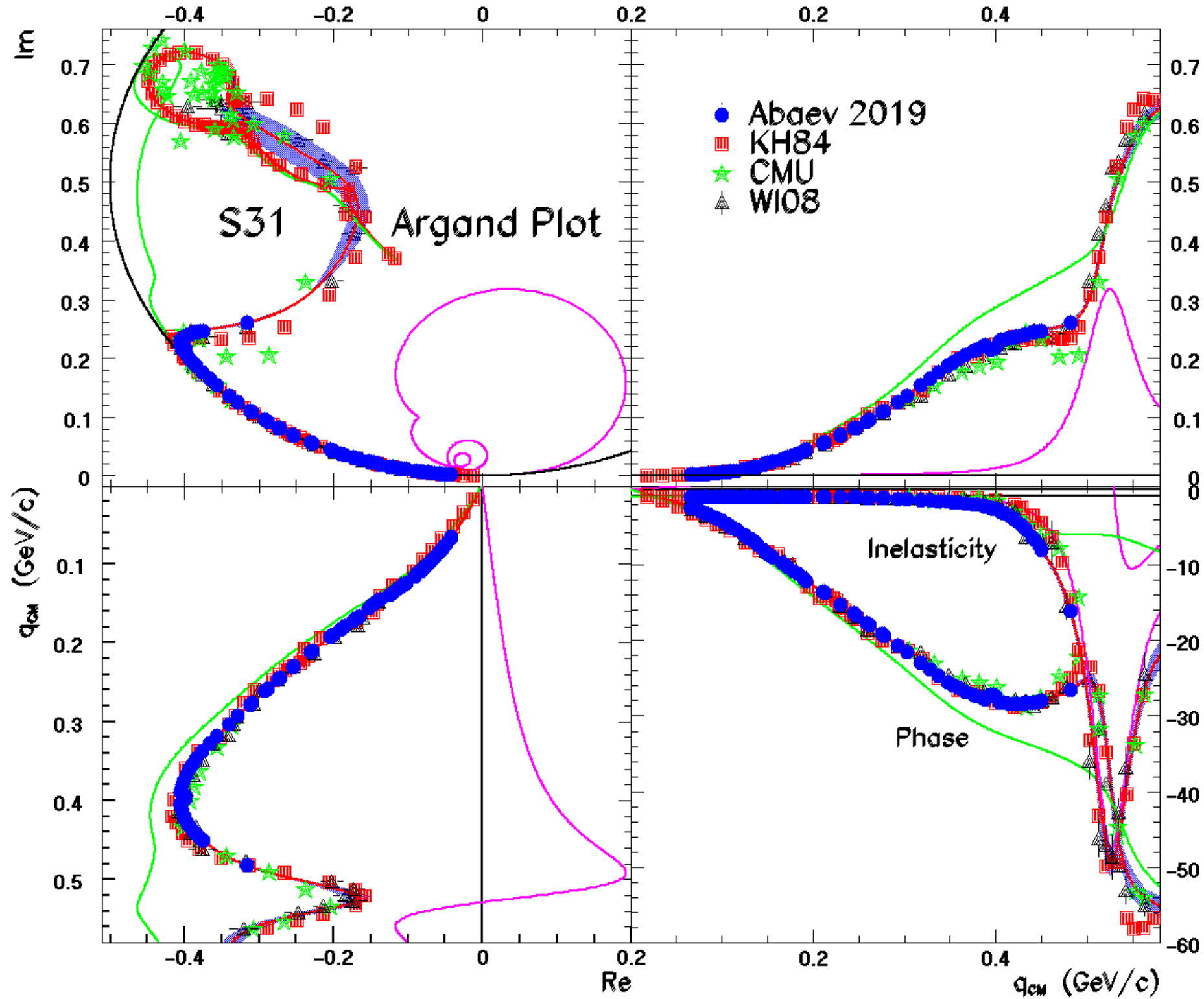




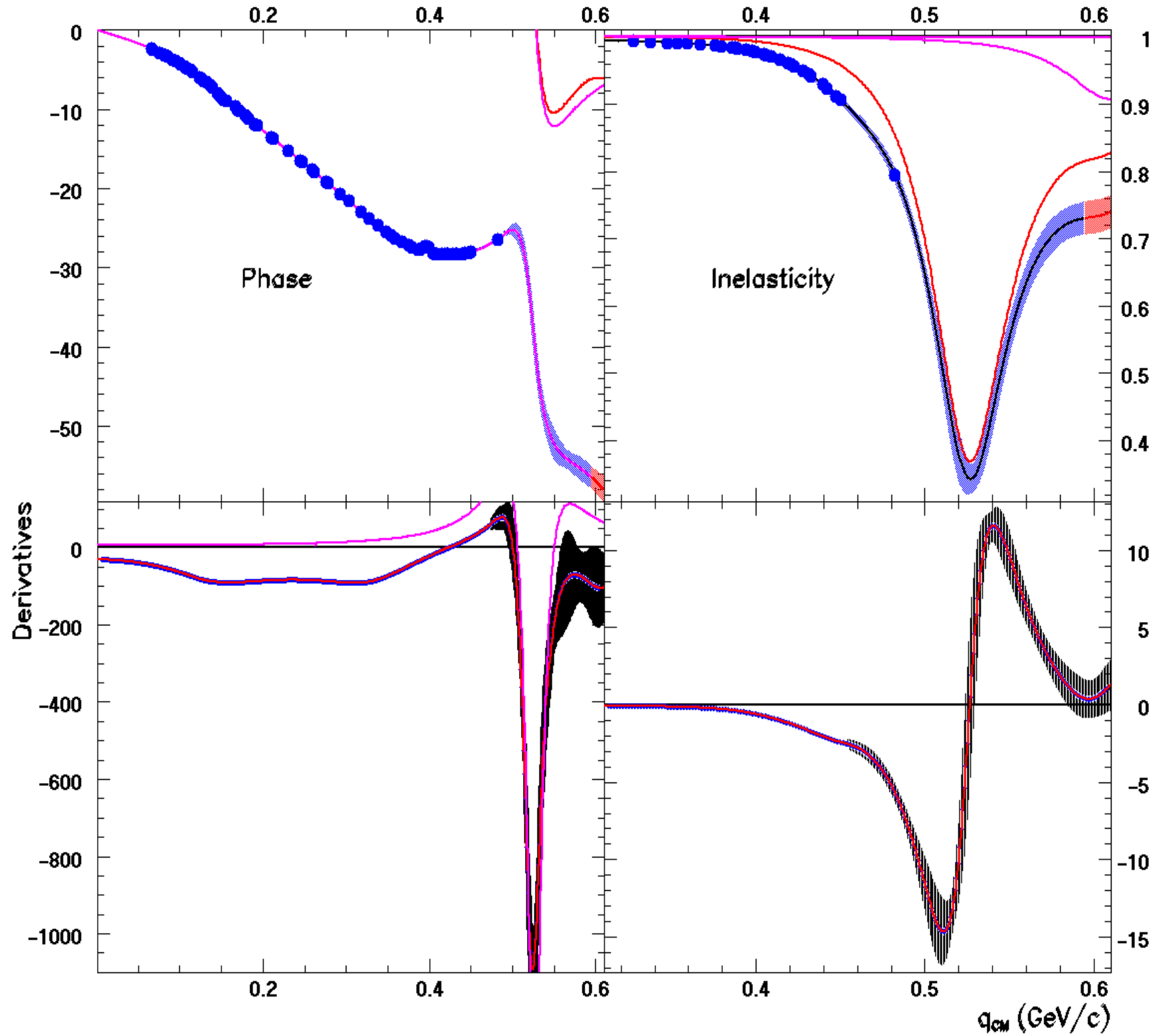




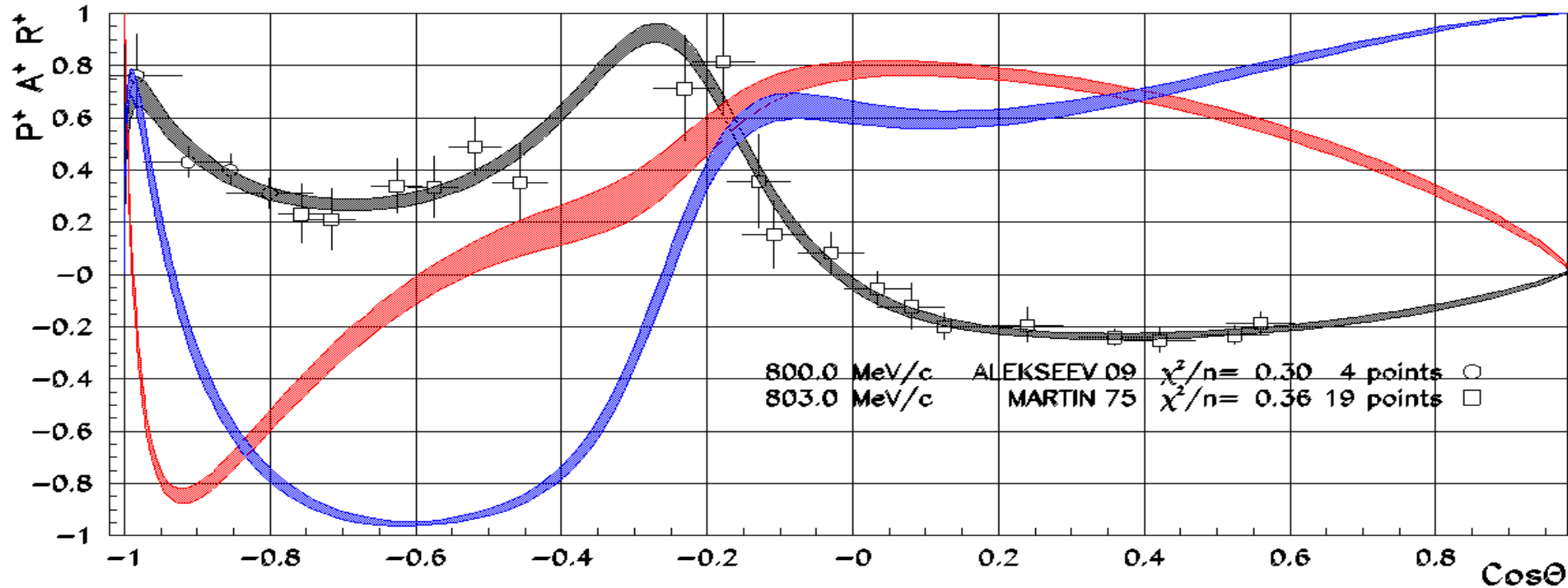
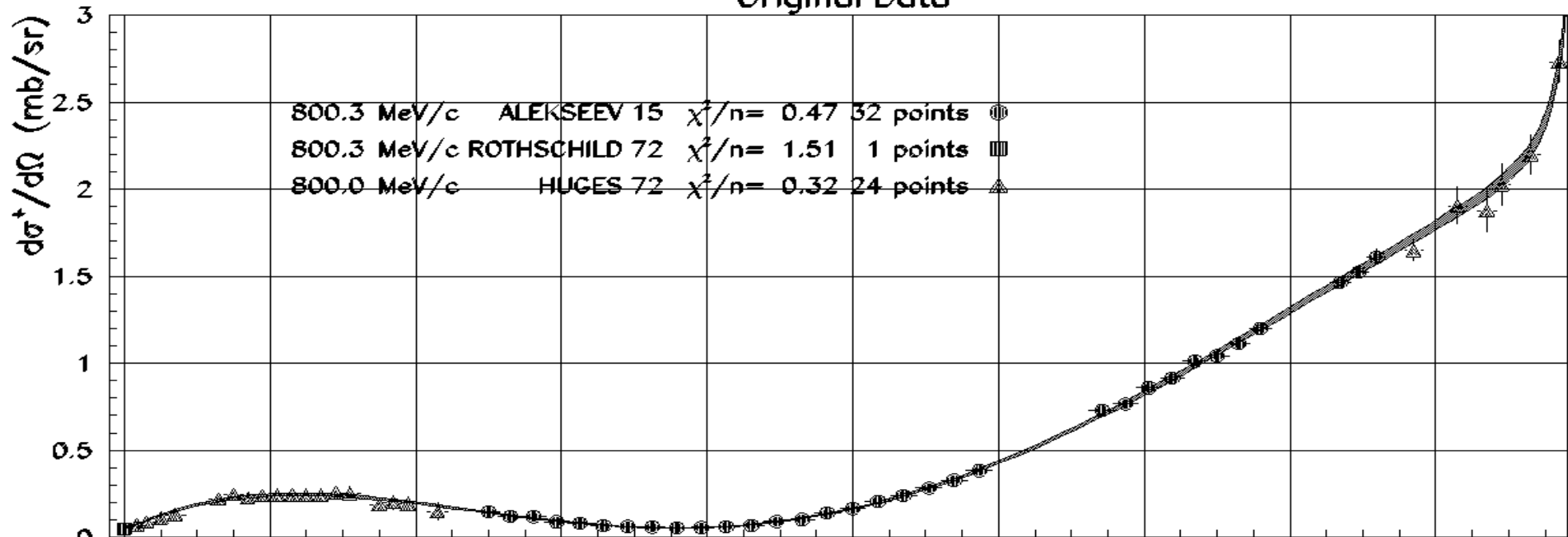




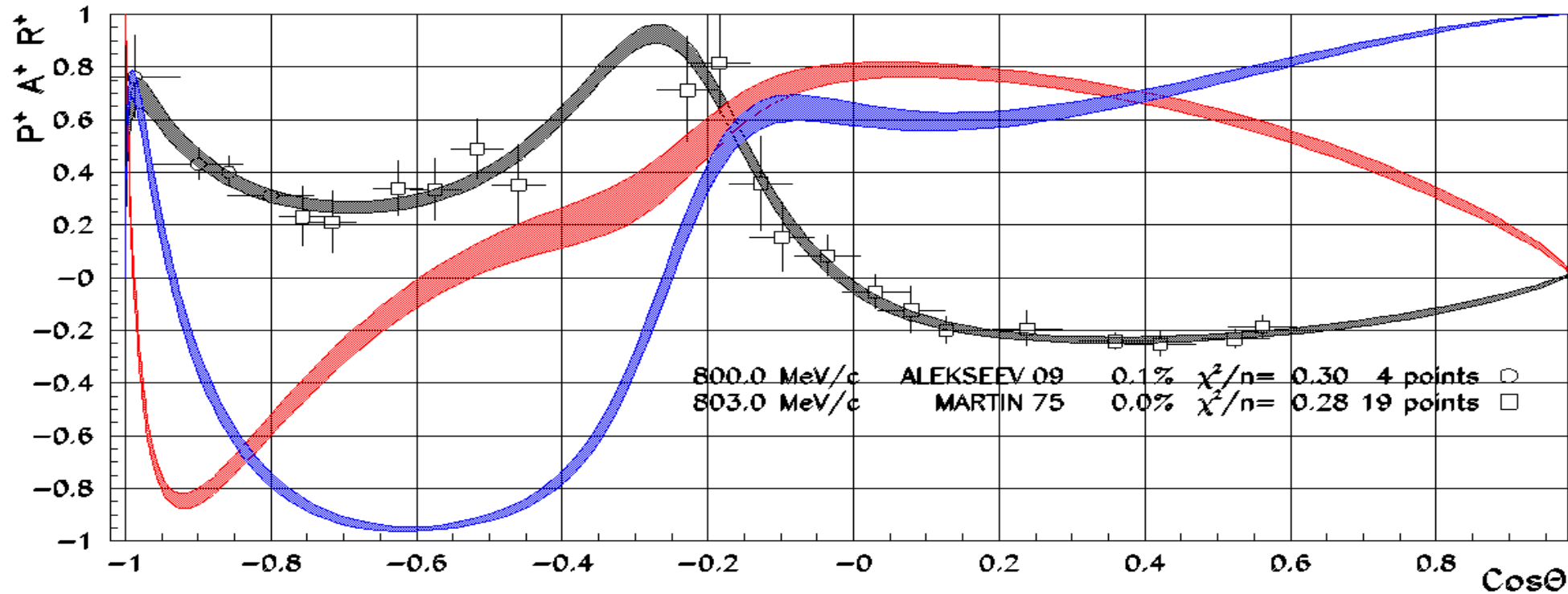
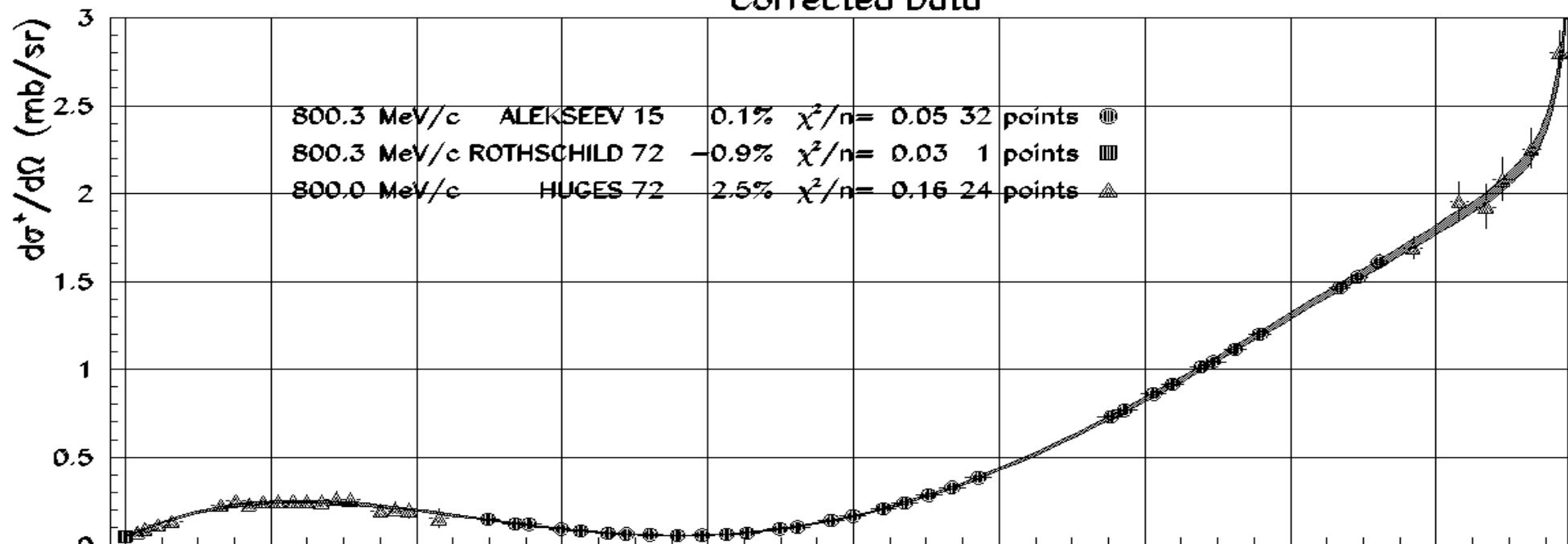


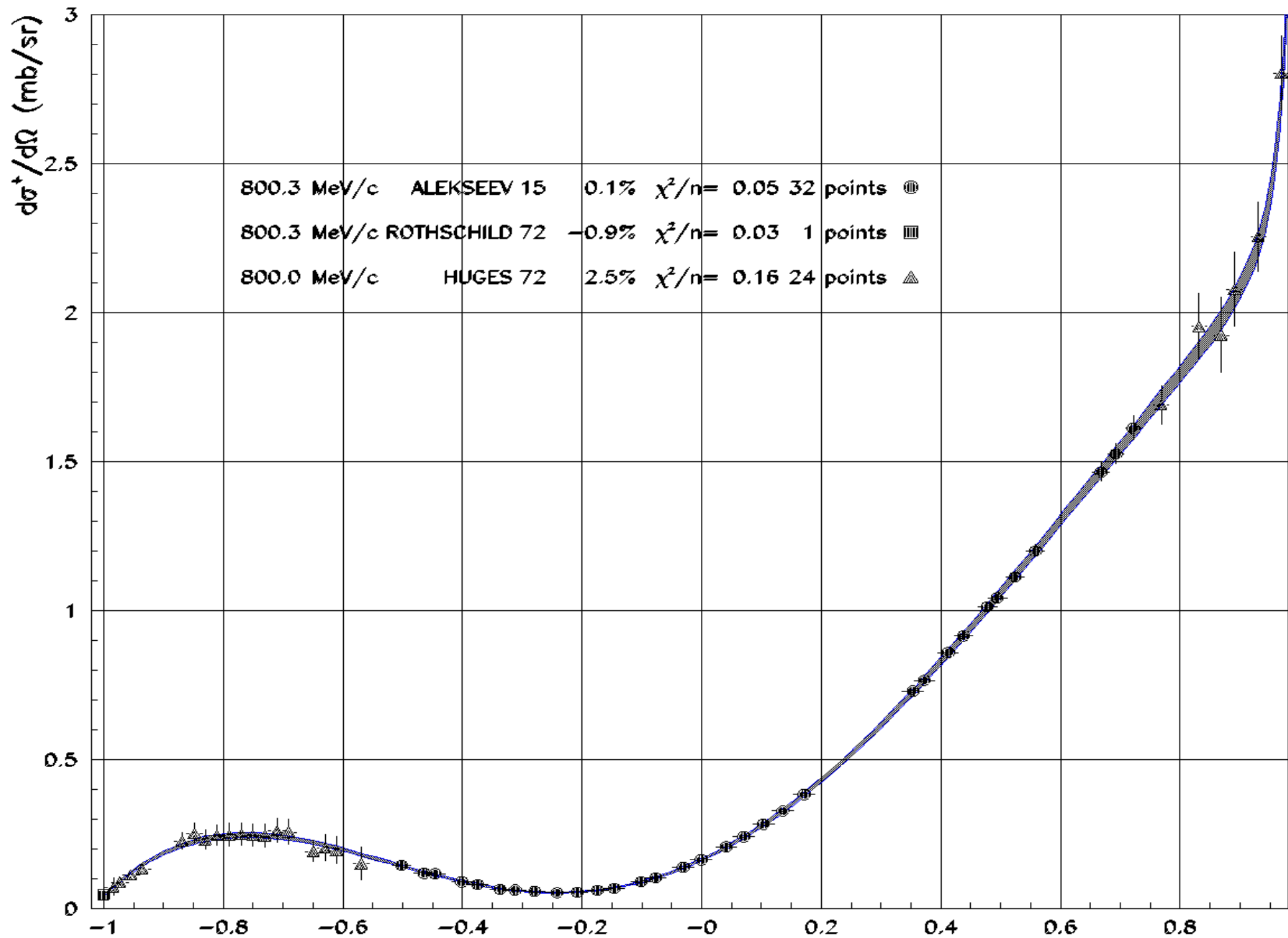


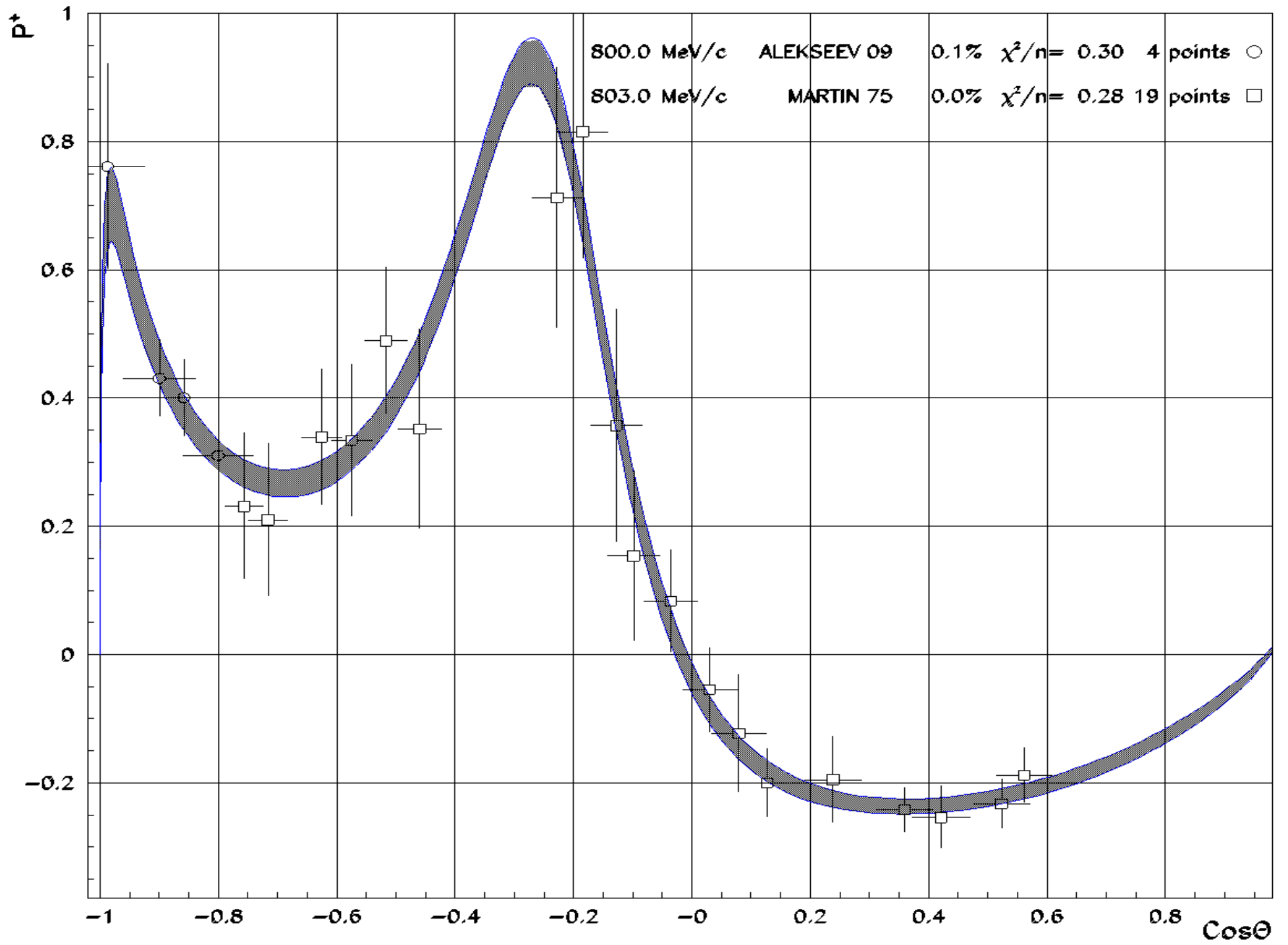
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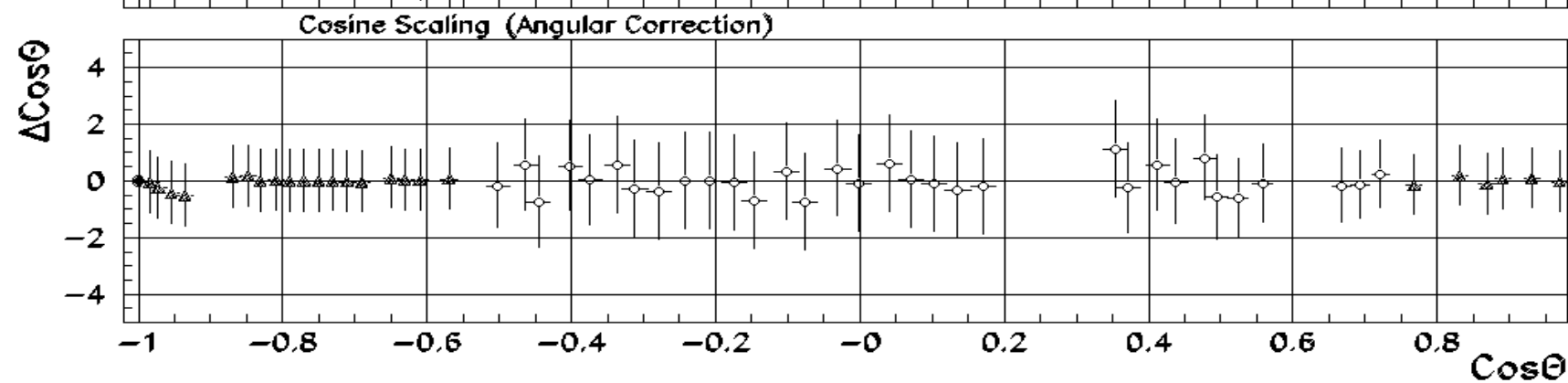
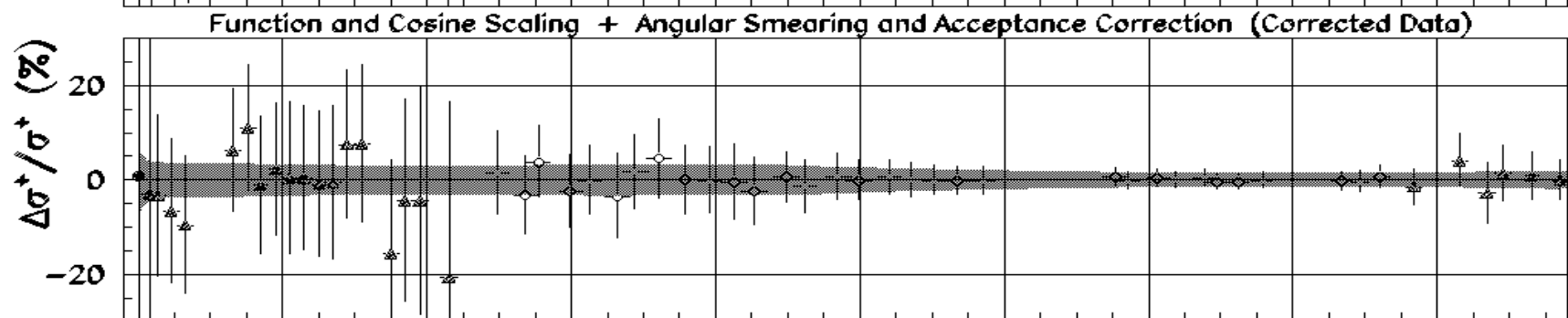
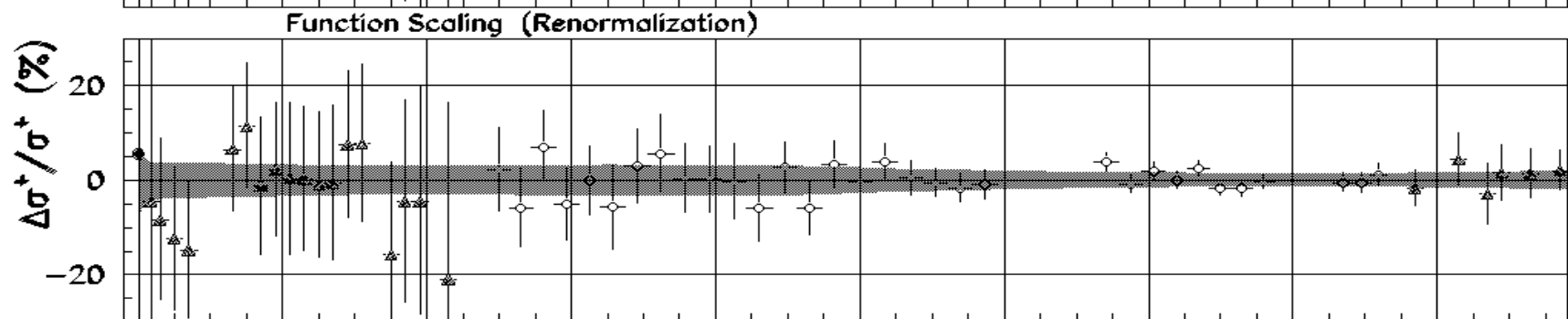
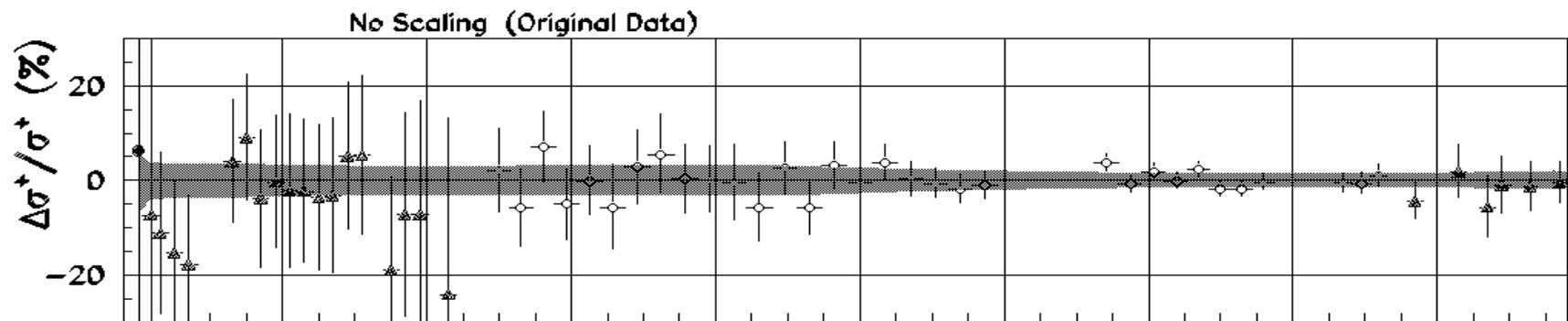


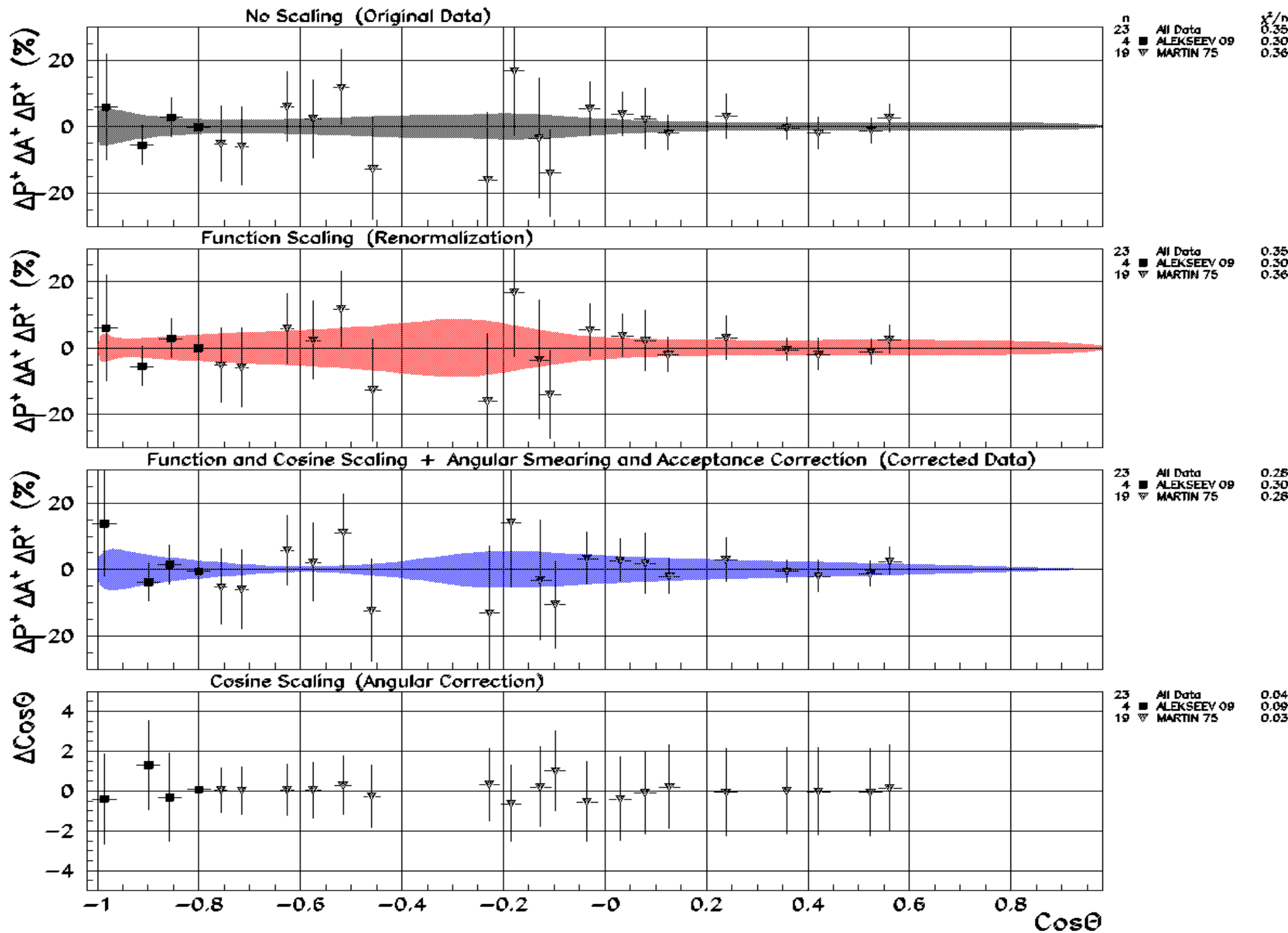
### Corrected Data



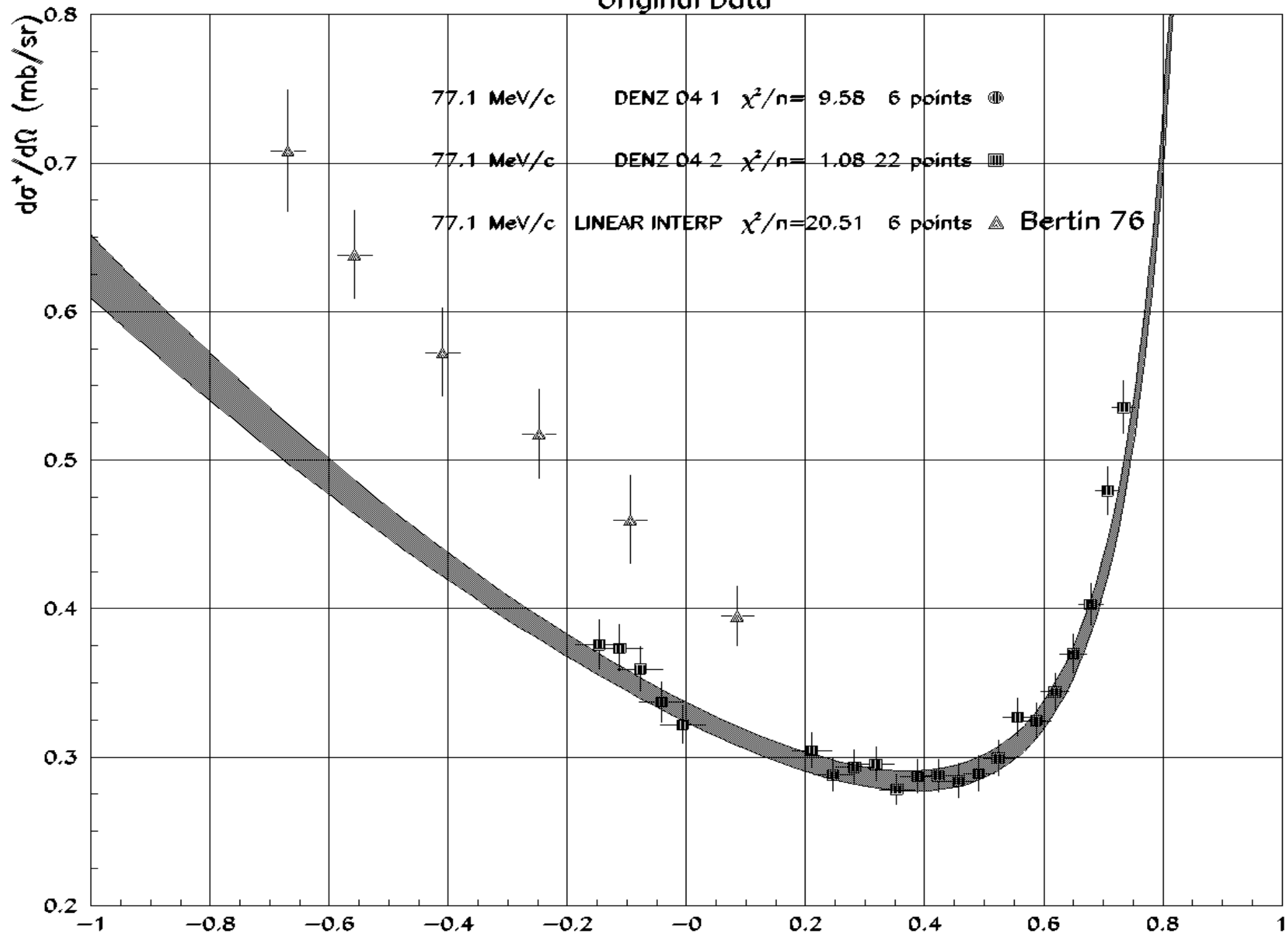






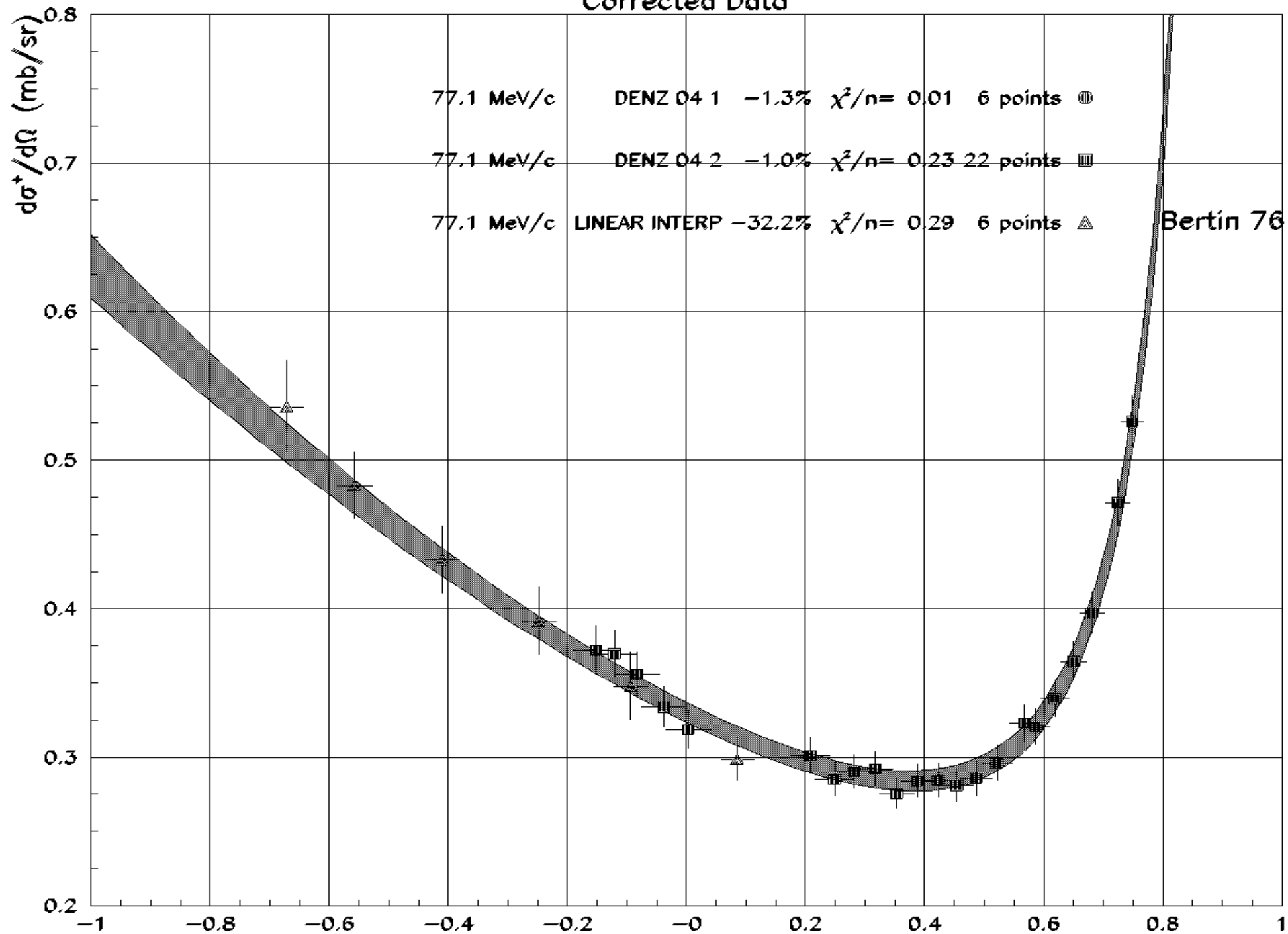


# Original Data

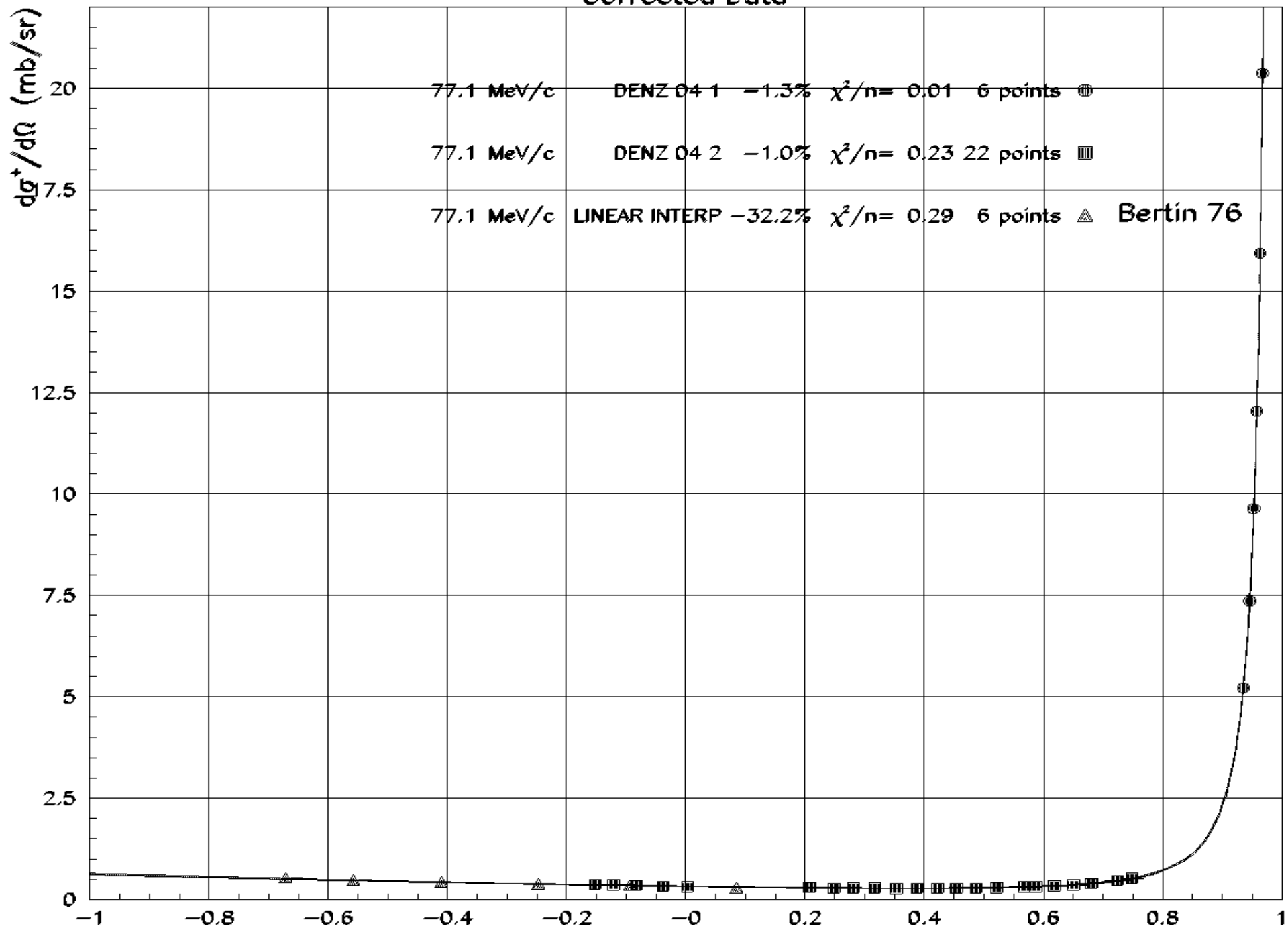


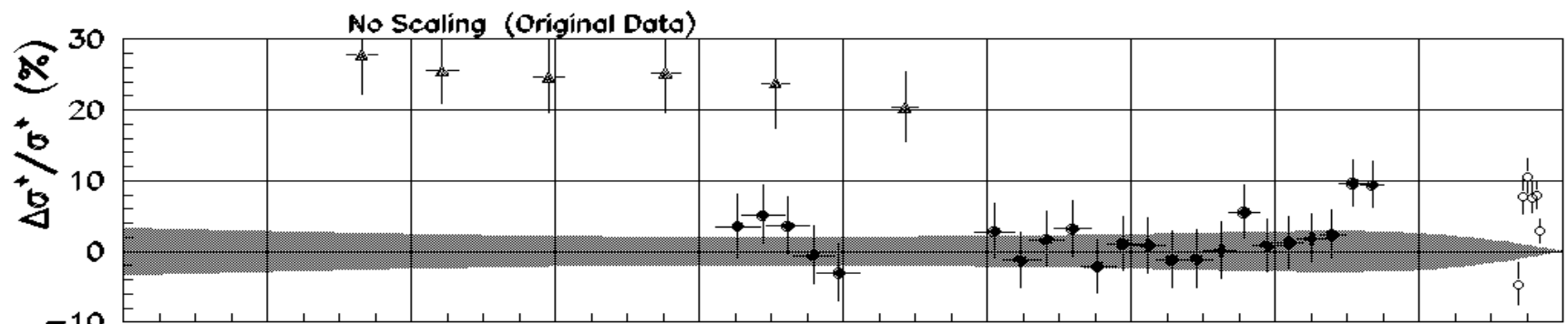


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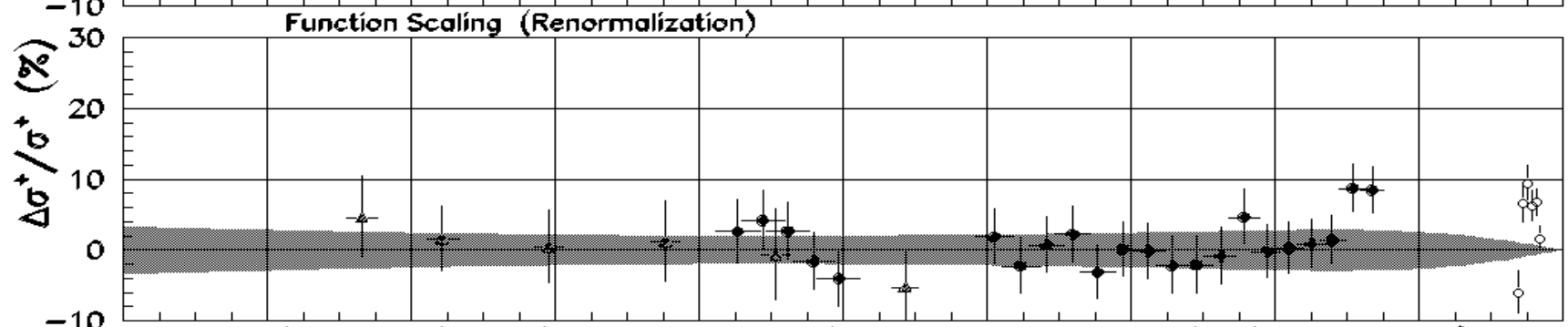


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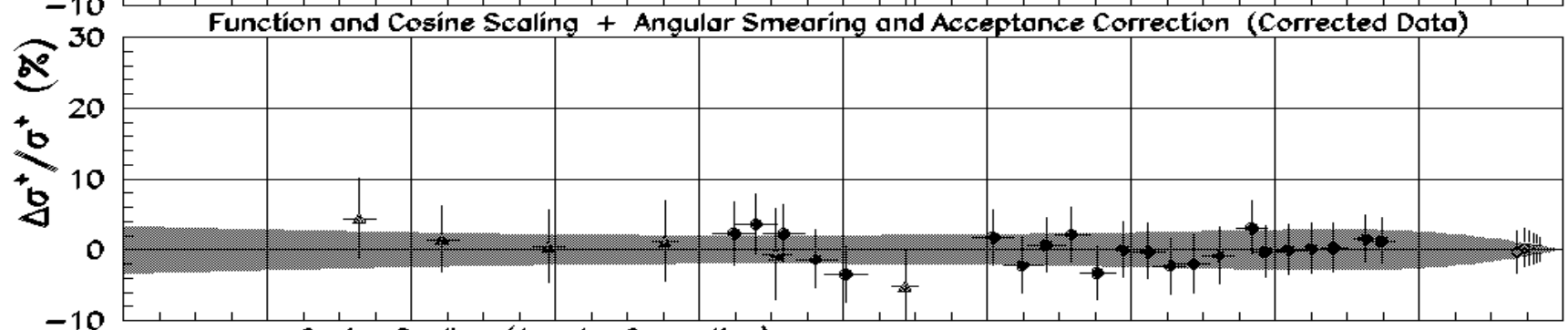




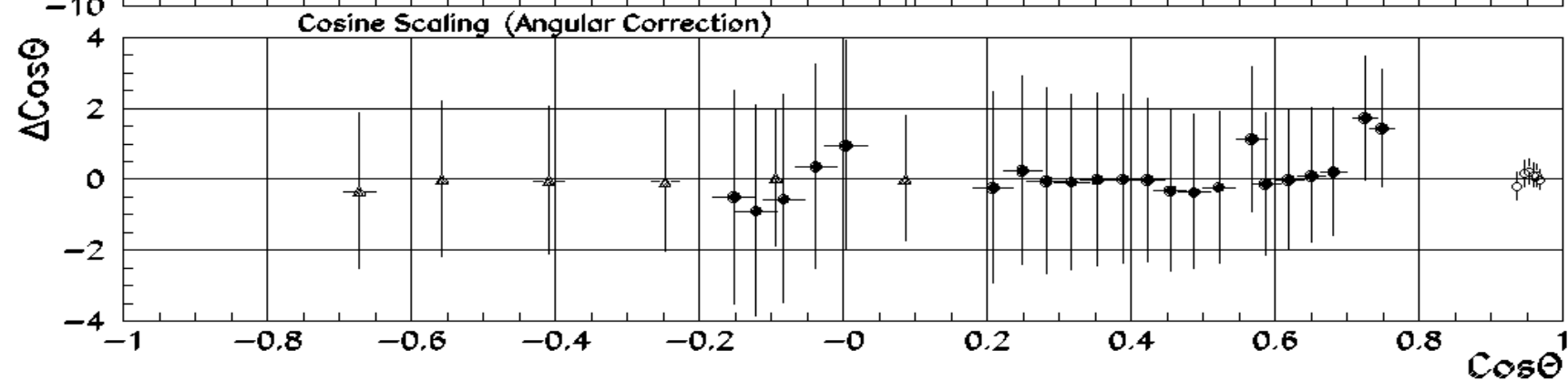
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34	All Data	6.01
6	○ DENZ 04 1	9.56
22	● DENZ 04 2	1.08
6	▲ LINEAR INTERP	20.51



n		$\chi^2/n$
34	All Data	1.92
6	○ DENZ 04 1	7.31
22	● DENZ 04 2	0.86
6	▲ LINEAR INTERP	0.31



n		$\chi^2/n$
34	All Data	0.20
6	○ DENZ 04 1	0.01
22	● DENZ 04 2	0.23
6	▲ LINEAR INTERP	0.29



n		$\chi^2/n$
34	All Data	0.10
6	○ DENZ 04 1	0.14
22	● DENZ 04 2	0.11
6	▲ LINEAR INTERP	0.00

$$\pi^+ p \longrightarrow \pi^+ p \quad \mathbf{f} = \mathbf{T}_3$$

$$\mathbf{T} = \frac{\eta \cdot e^{2i \cdot \delta} - 1}{2i}$$

$$\pi^+ p \longrightarrow \pi^+ p \quad \mathbf{f} = \mathbf{T}_3$$

$$\pi^- p \longrightarrow \pi^- p \quad \mathbf{f} = \frac{1}{3} \mathbf{T}_3 + \frac{2}{3} \mathbf{T}_1$$

$$\mathbf{T} = \frac{\eta \cdot e^{2i \cdot \delta} - 1}{2i}$$

$$\pi^- p \longrightarrow \pi^0 n \quad \mathbf{f} = \frac{\sqrt{2}}{3} \mathbf{T}_3 - \frac{\sqrt{2}}{3} \mathbf{T}_1$$

$$\pi^+ p \longrightarrow \pi^+ p \quad \mathbf{f} = \mathbf{T}_3$$

$$\mathbf{T} = \frac{\eta \cdot e^{2i \cdot \delta} - 1}{2i}$$

$$\pi^- p \longrightarrow \pi^- p \quad \mathbf{f} = \frac{1}{3} \mathbf{T}_3 + \frac{2}{3} \mathbf{T}_1$$

$$\mathbf{T}_3 \neq \mathbf{T}_3$$

**Зарядовое расщепление**

$$\pi^- p \longrightarrow \pi^0 n \quad \mathbf{f} = \frac{\sqrt{2}}{3} \mathbf{T}_3 - \frac{\sqrt{2}}{3} \mathbf{T}_1$$

$$\pi^+ p \longrightarrow \pi^+ p \quad \mathbf{f} = \mathbf{T}_3$$

$$\mathbf{T} = \frac{\eta \cdot e^{2i \cdot \delta} - 1}{2i}$$

$$\pi^- p \longrightarrow \pi^- p \quad \mathbf{f} = \frac{1}{3} \mathbf{T}_3 + \frac{2}{3} \mathbf{T}_1$$

$$\mathbf{T}_3 \neq \mathbf{T}_3$$

**Зарядовое расщепление**

$$\mathbf{T}_{13} = \frac{2\sqrt{2}}{3} \cdot \frac{\eta_{13} e^{i(\delta_1 + \delta_3)}}{2i}$$

**Изоспиновое  
Смешивание**

$$\pi^- p \longrightarrow \pi^0 n \quad \mathbf{f} = \frac{\sqrt{2}}{3} \mathbf{T}_3 - \frac{\sqrt{2}}{3} \mathbf{T}_1$$

$$\pi^+ p \longrightarrow \pi^+ p \quad f = T_3$$

$$T = \frac{\eta \cdot e^{2i \cdot \delta} - 1}{2i}$$

$$\pi^- p \longrightarrow \pi^- p \quad f = \frac{1}{3} T_3 + \frac{2}{3} T_1$$

$$T_3 \neq T_3$$

**Зарядовое расщепление**

$$T_{13} = \frac{2\sqrt{2}}{3} \cdot \frac{\eta_{13} e^{i(\delta_1 + \delta_3)}}{2i}$$

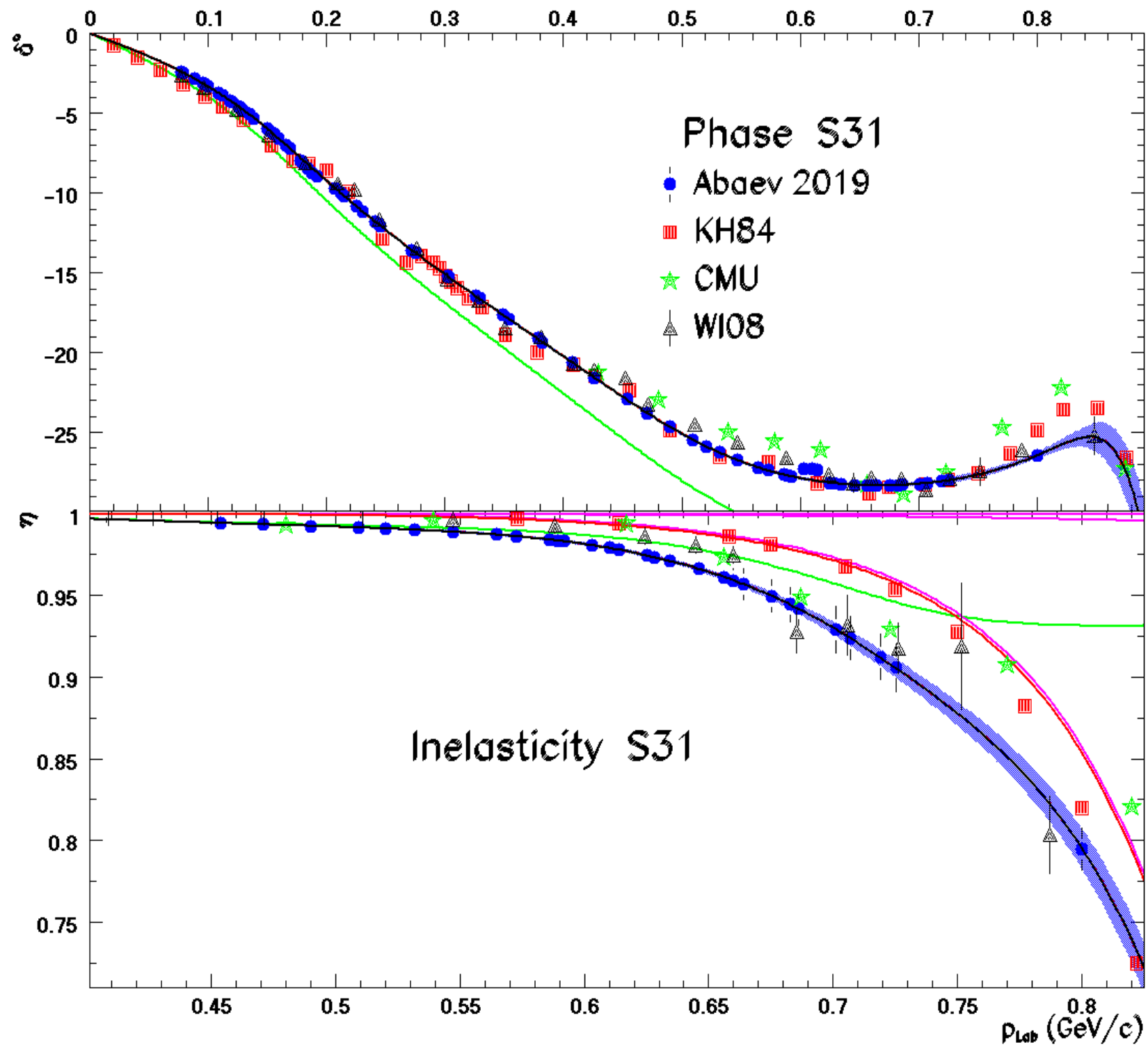
**Изоспиновое  
Смешивание**

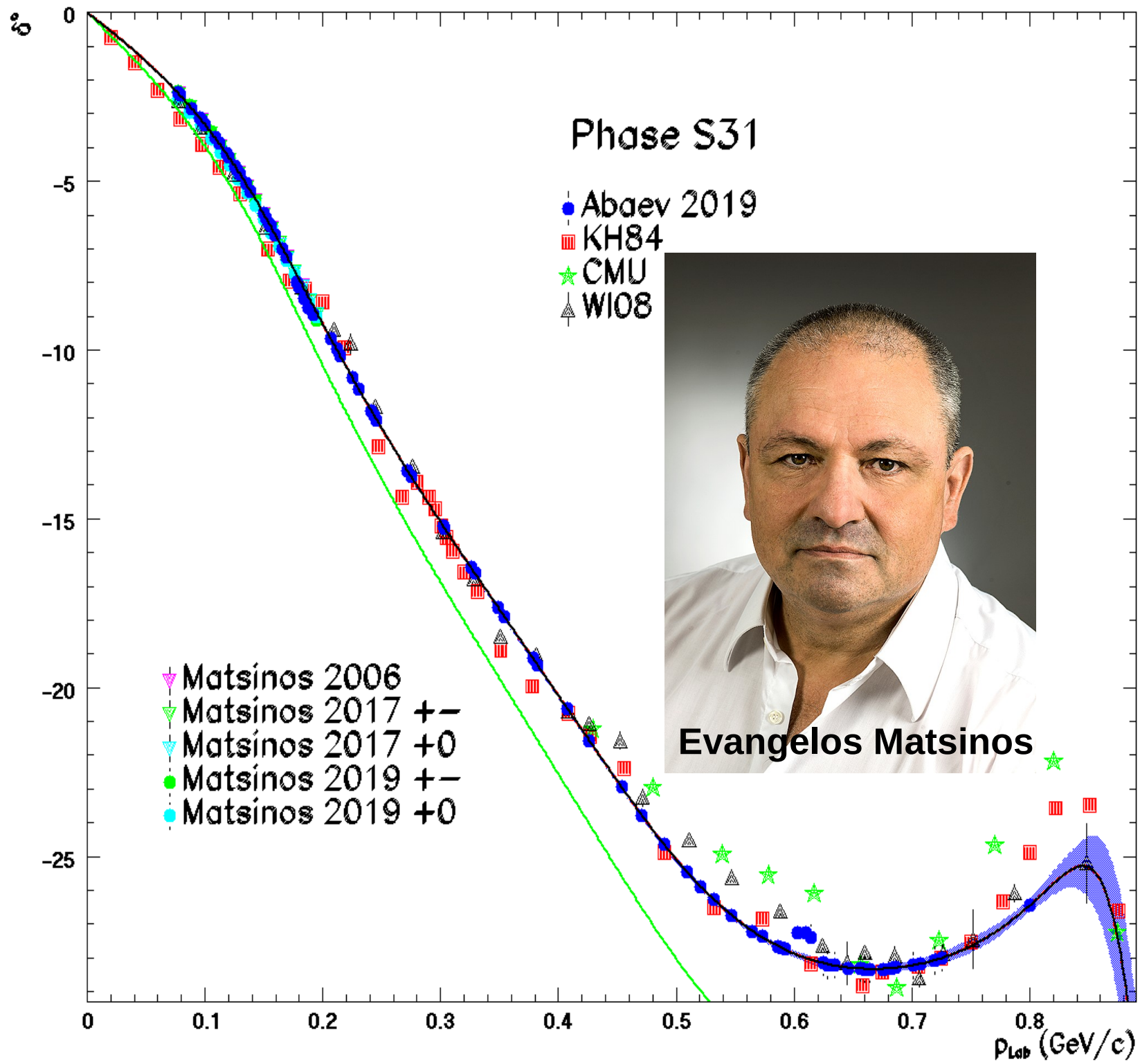
$$f = \frac{1}{3} T_3 + \frac{2}{3} T_1 - T_{13}$$

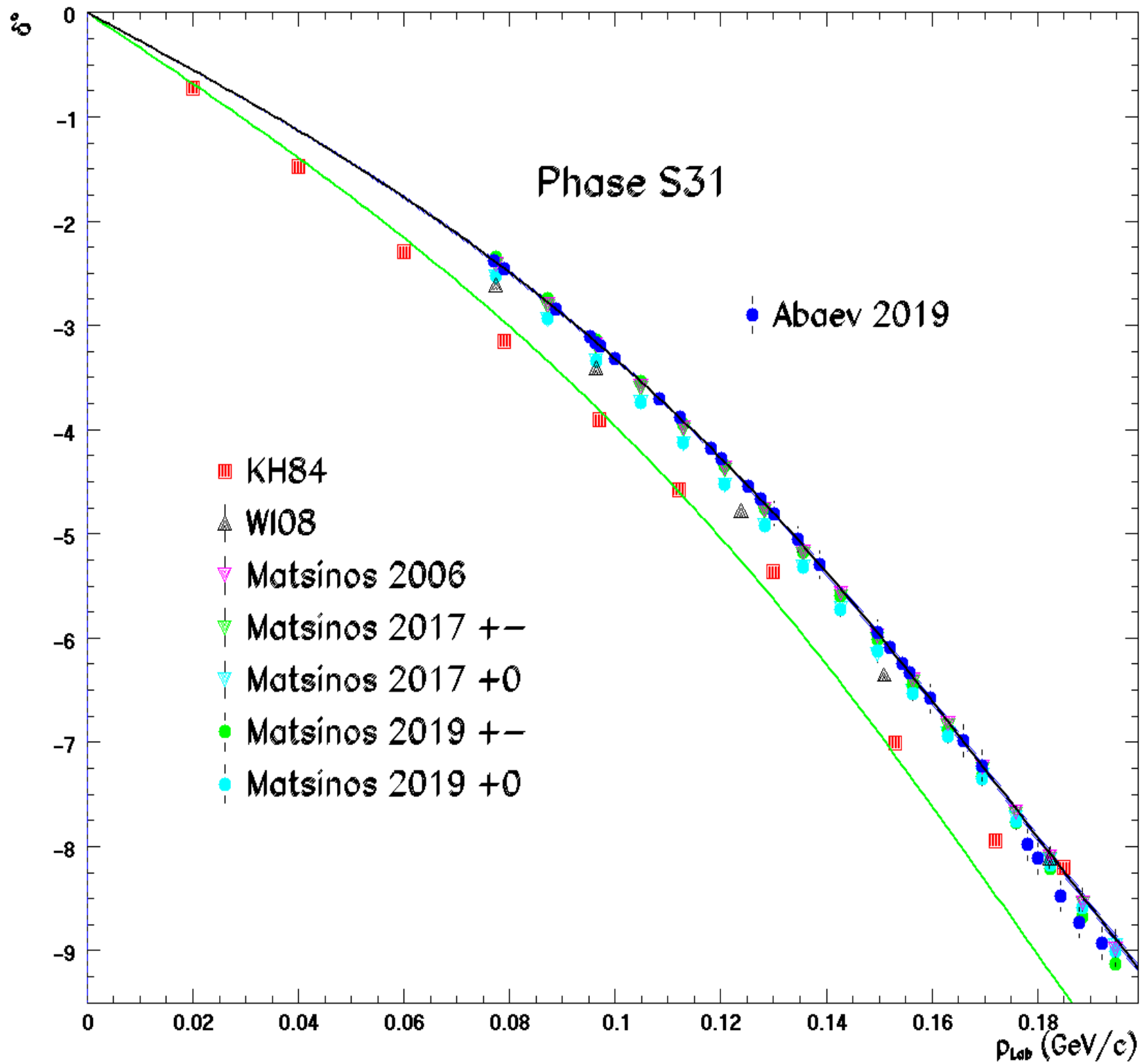
$$\pi^- p \longrightarrow \pi^0 n \quad f = \frac{\sqrt{2}}{3} T_3 - \frac{\sqrt{2}}{3} T_1$$

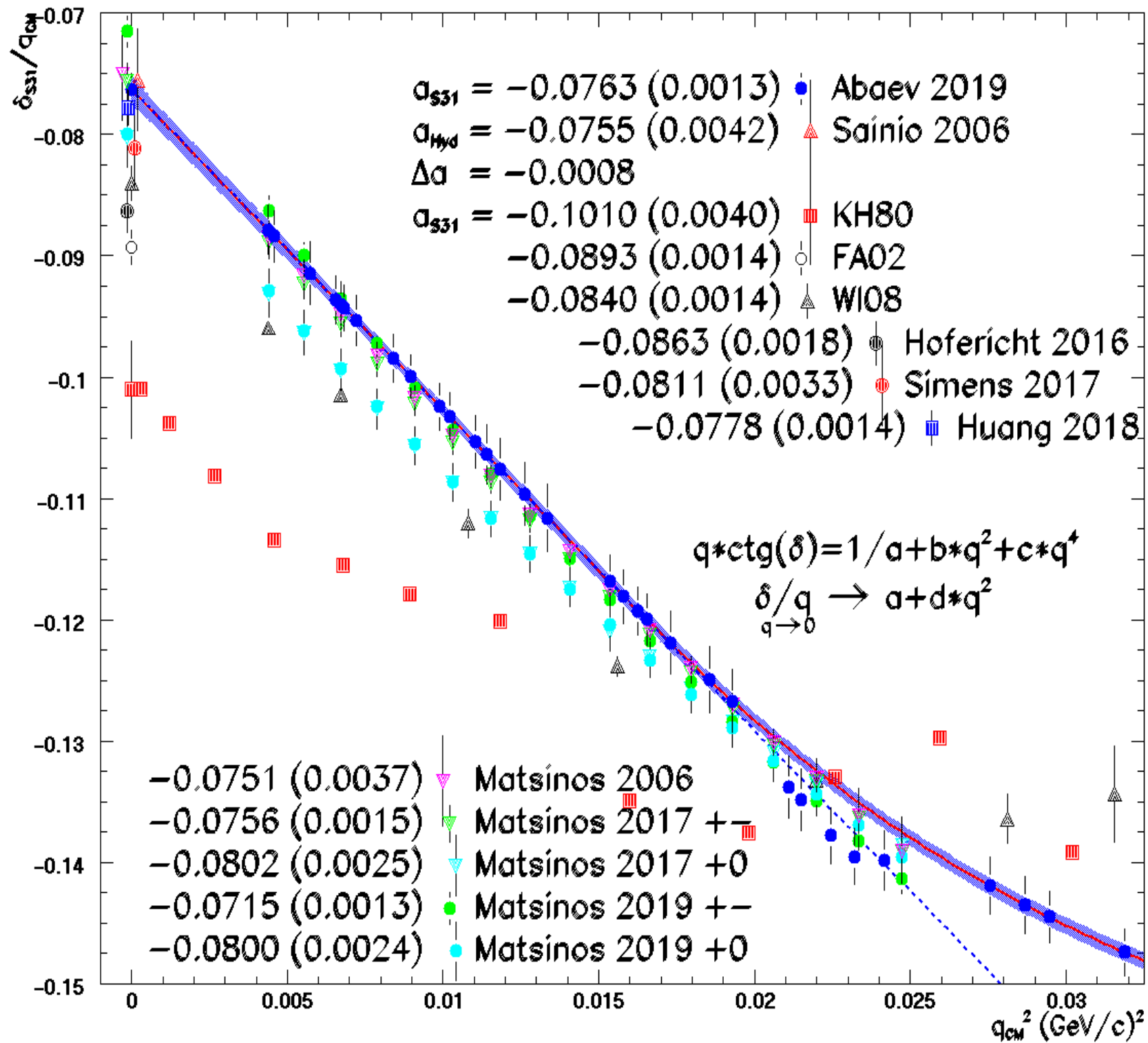
$$f = \frac{\sqrt{2}}{3} T_3 - \frac{\sqrt{2}}{3} T_1 - T_{13}$$

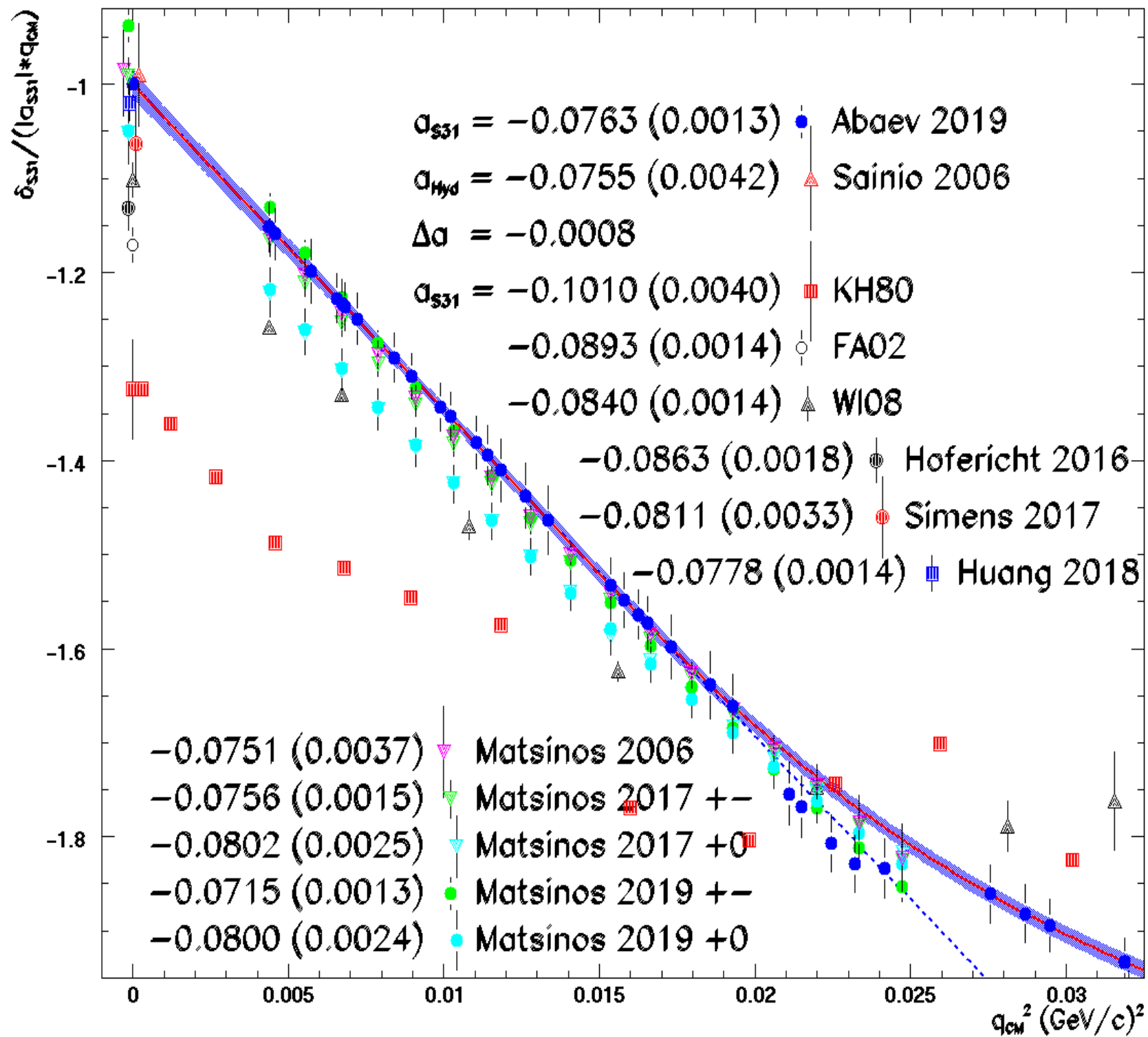


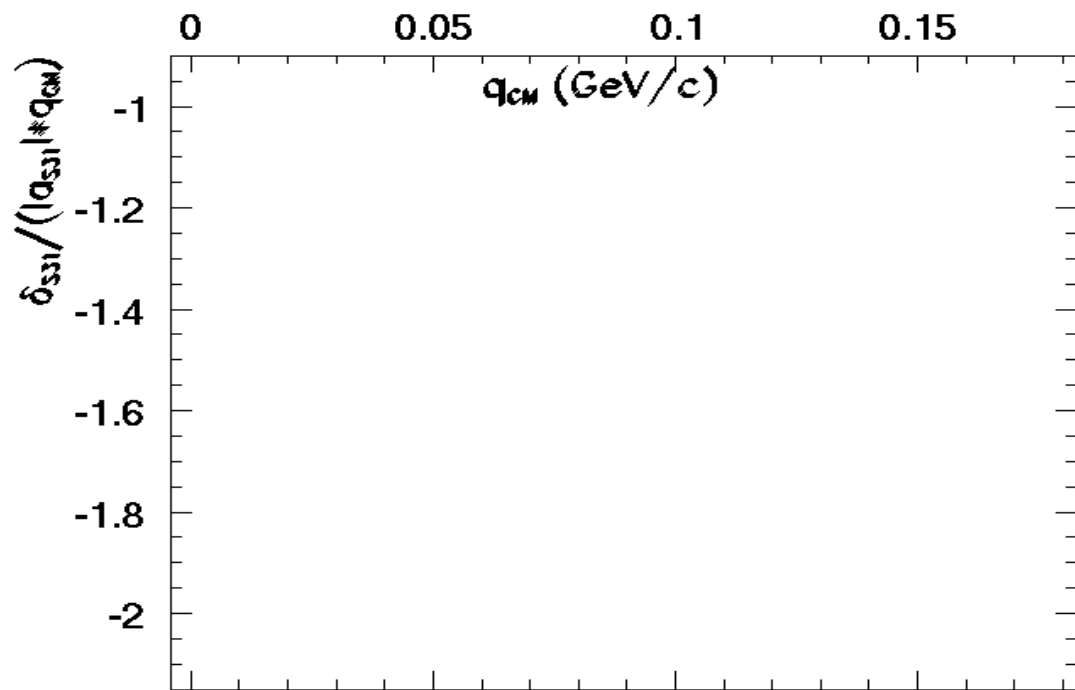


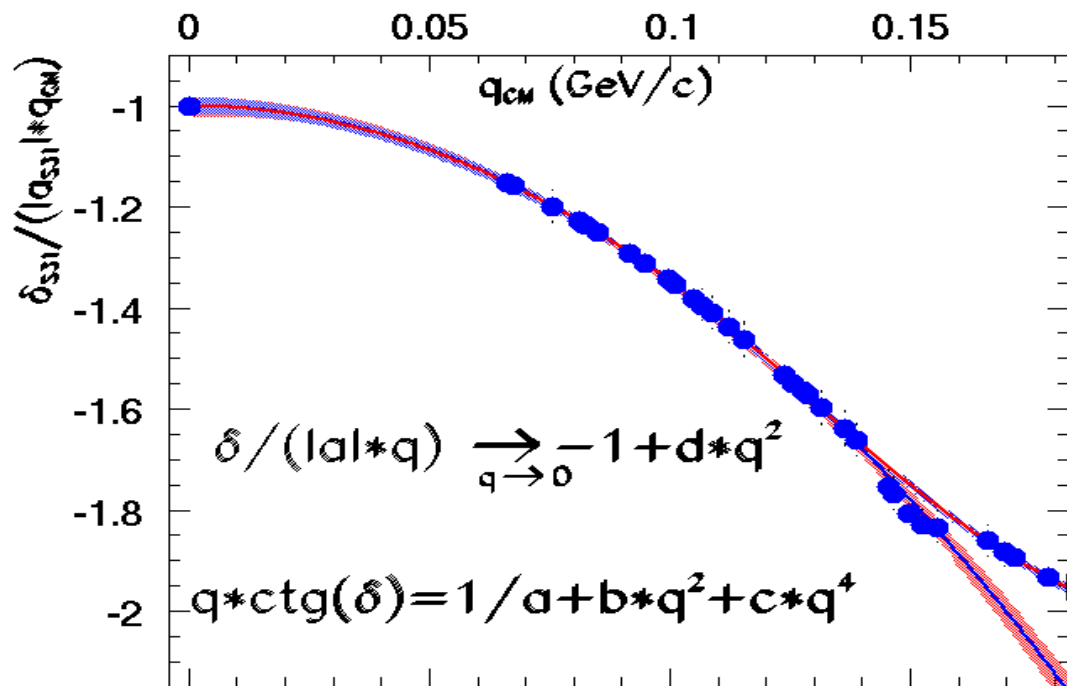


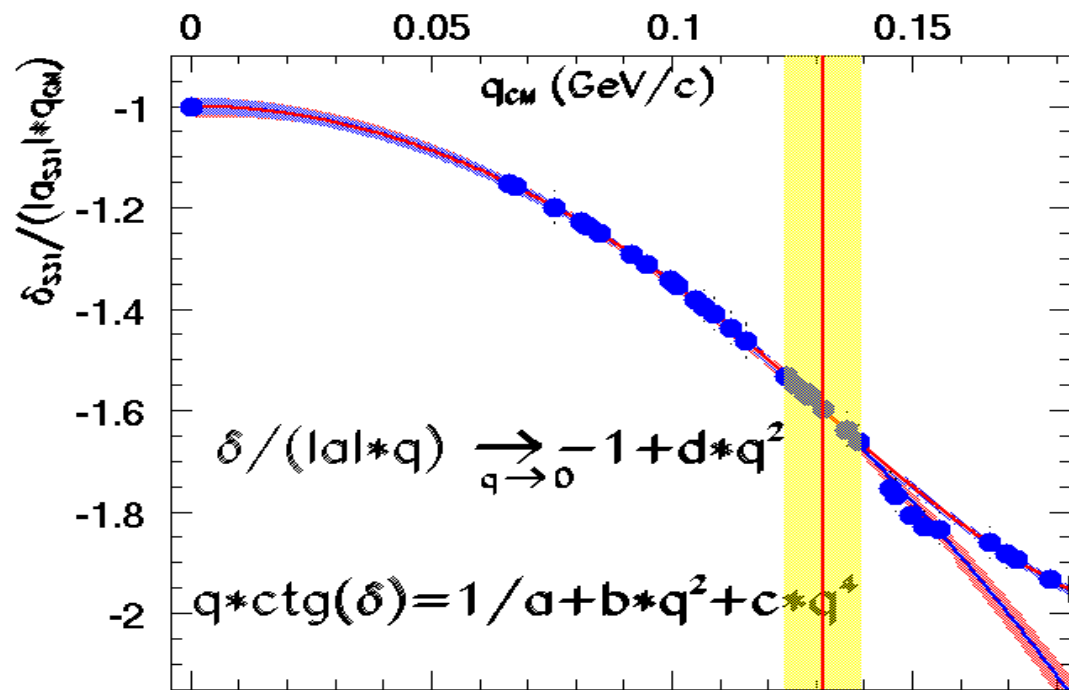






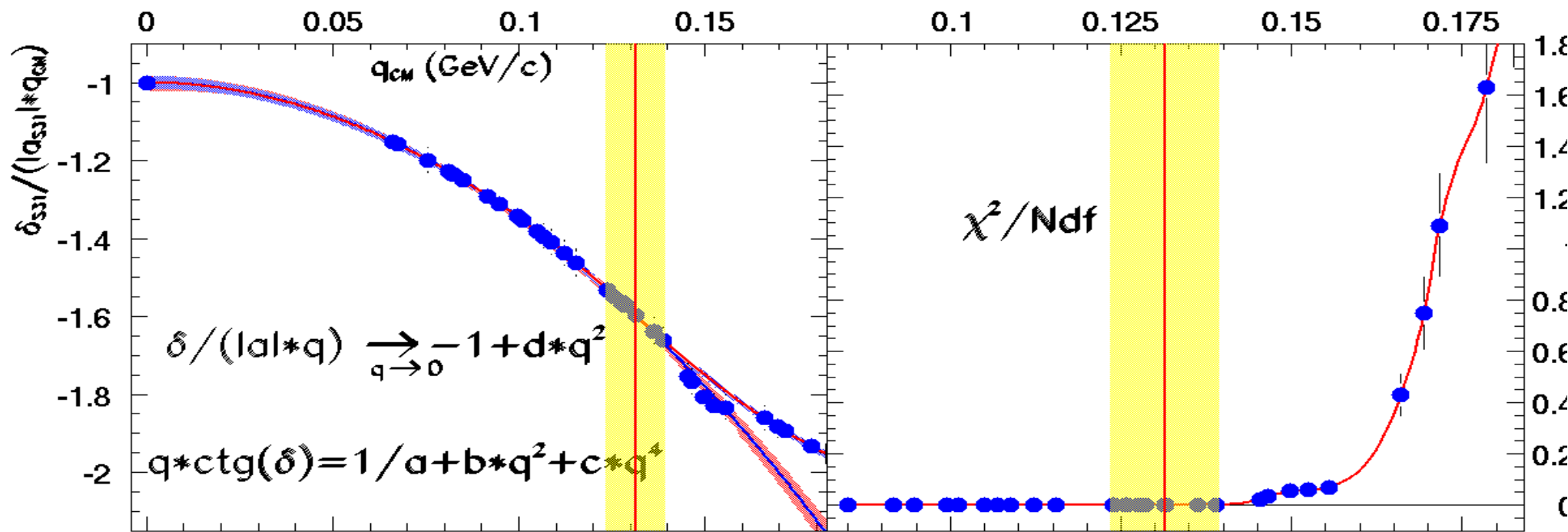


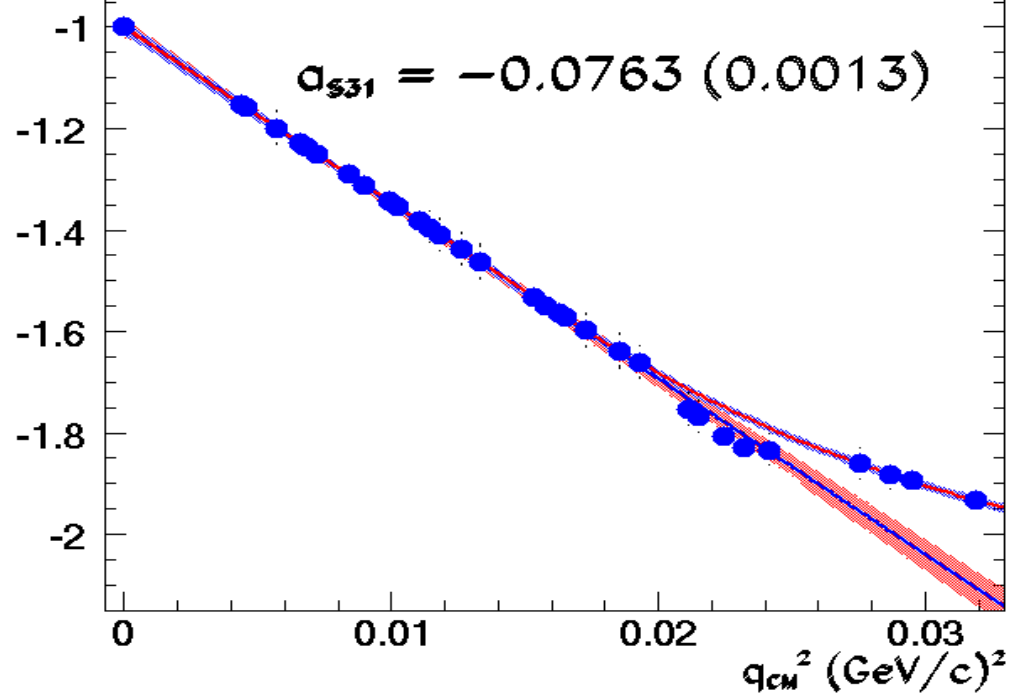
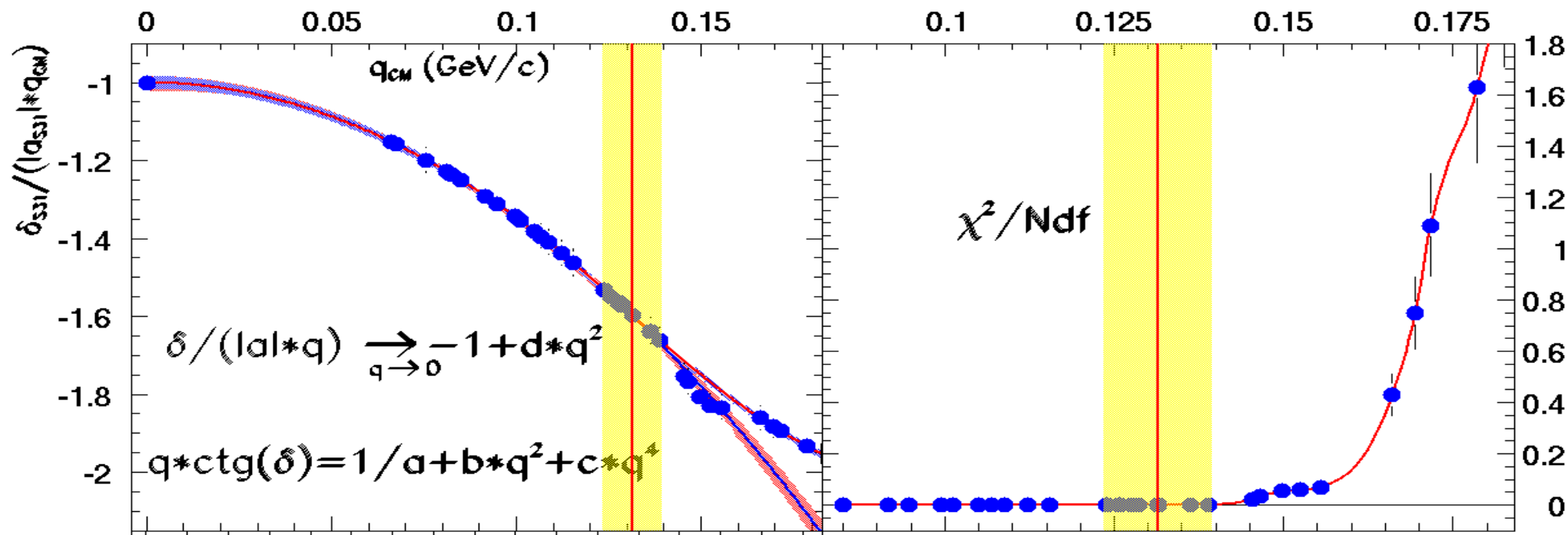


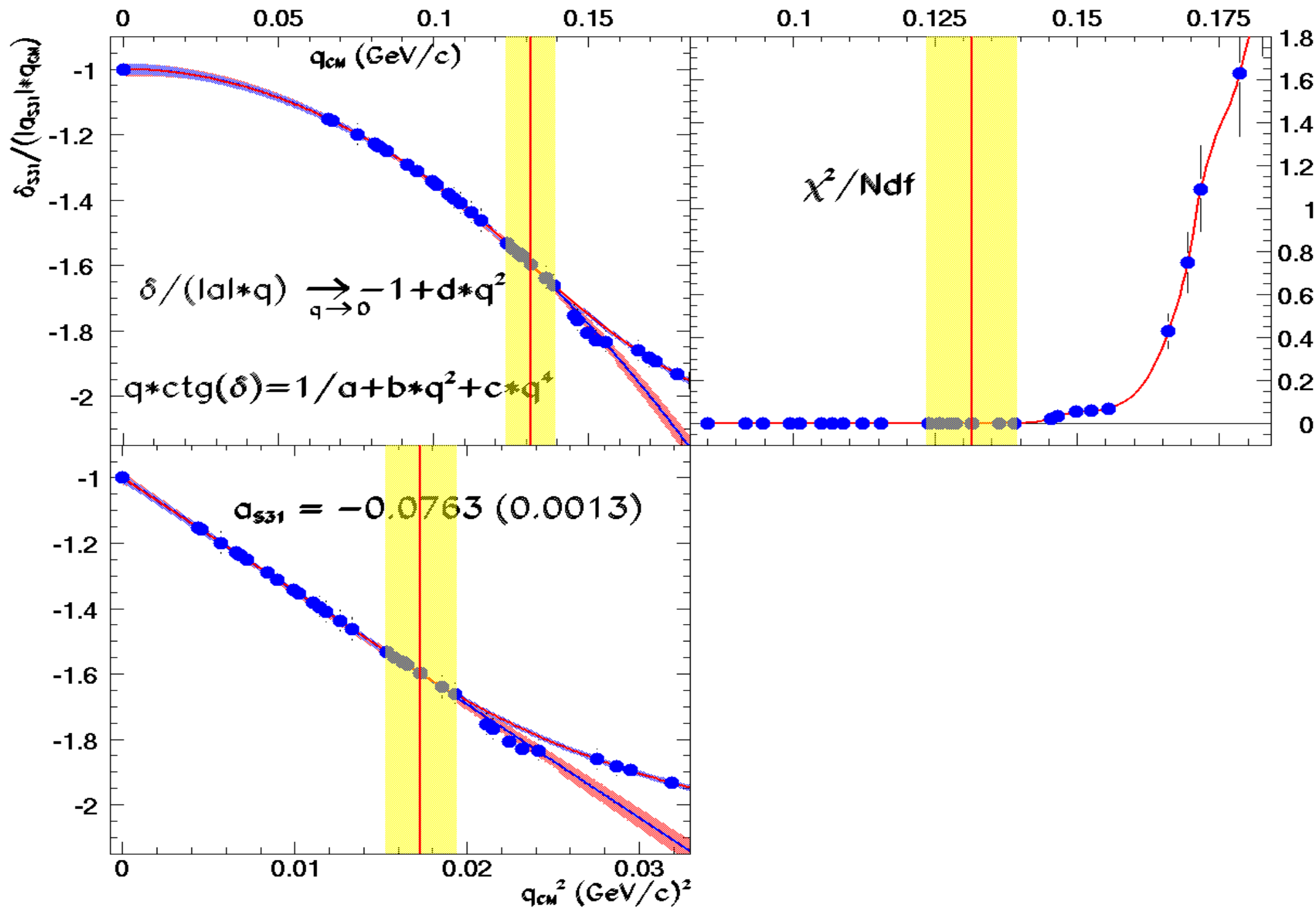


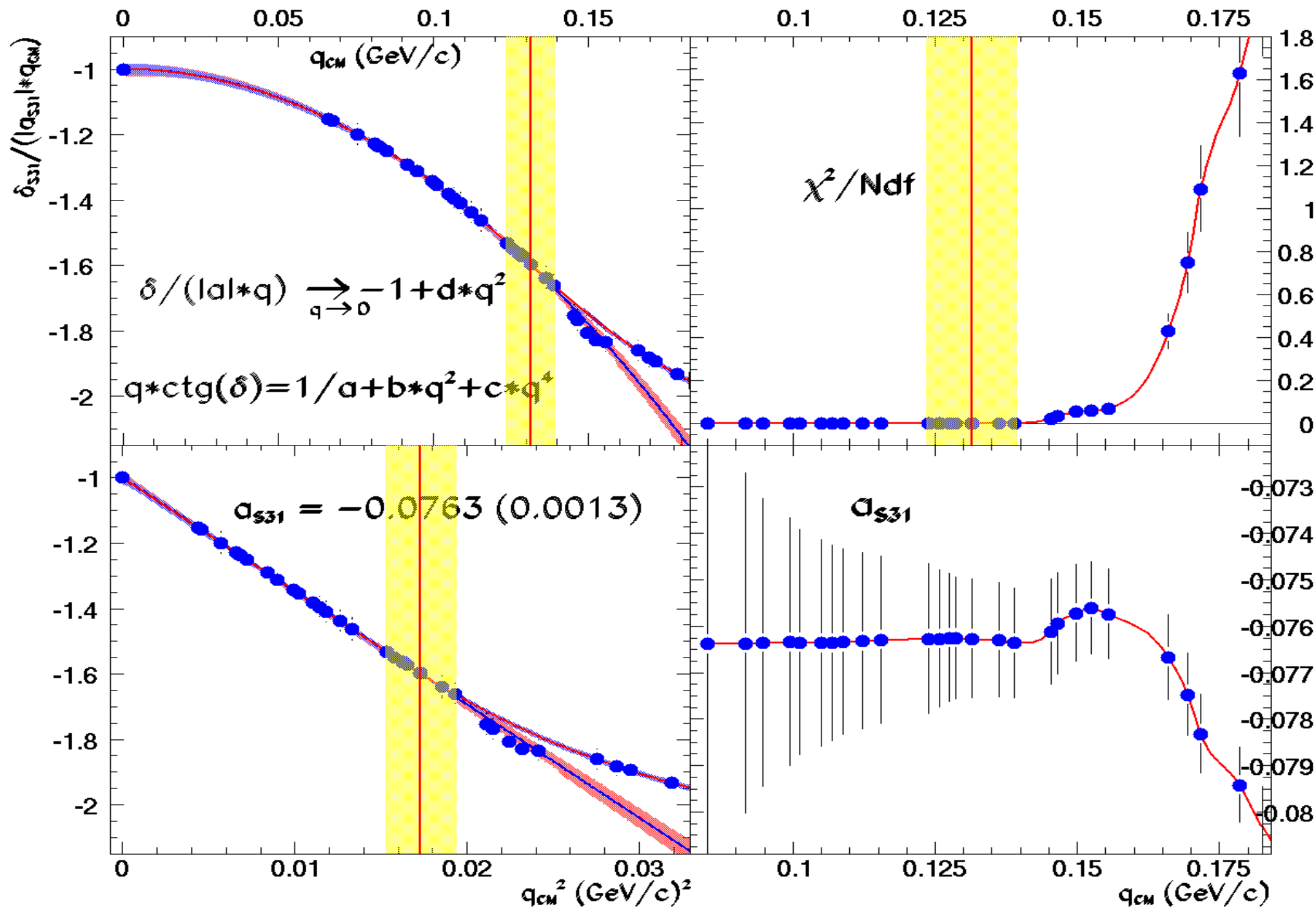


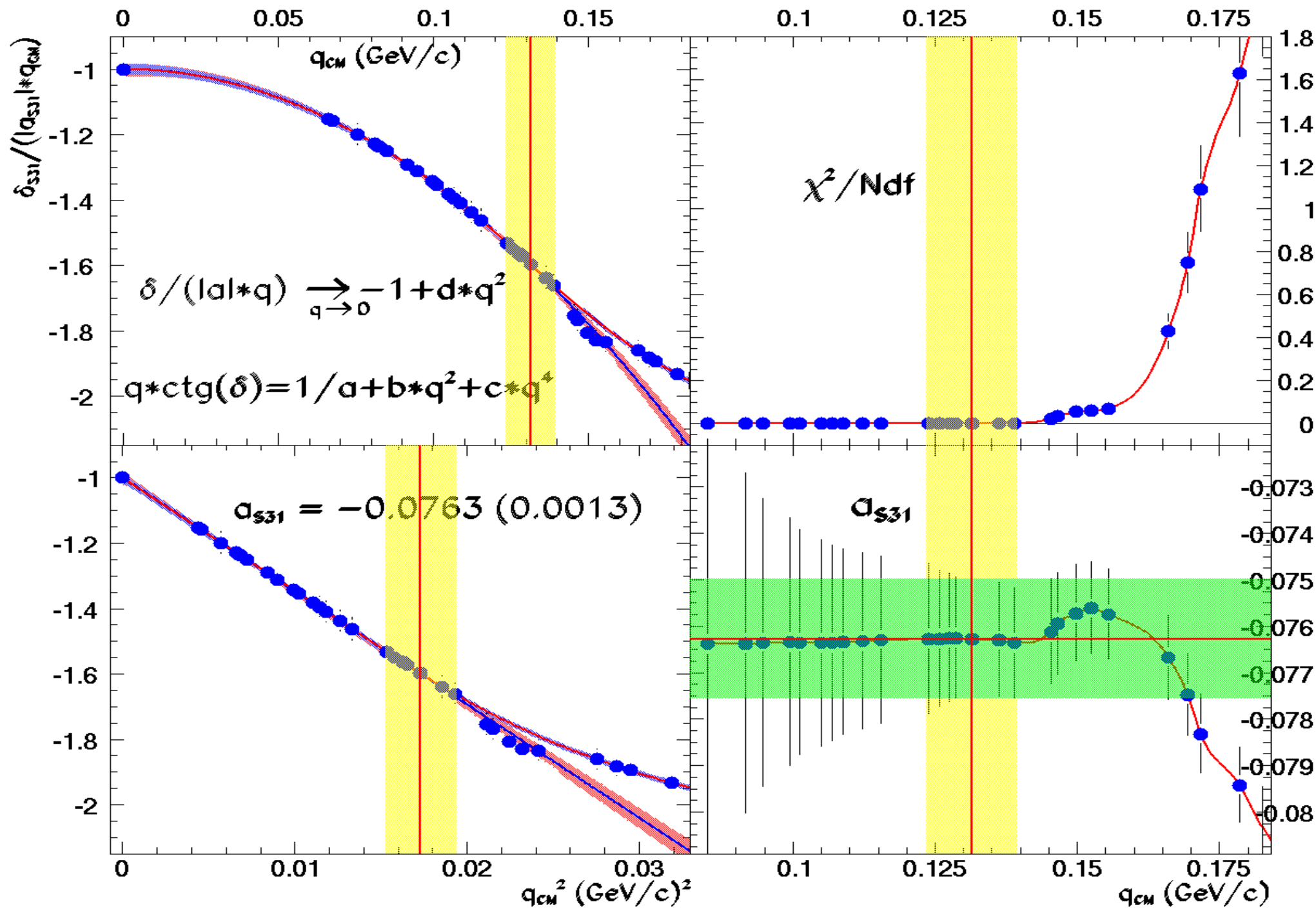












# Заключение

1.  $a_{31} = -0.0763 (13) \mu^{-1}$   $\pi^+ p \rightarrow \pi^+ p$  ФА  $.077 \div .8 \text{ GeV/c}$

2.  $q \cdot \cot(\delta) \equiv \frac{1}{a_{31}} + b \cdot q^2 + c \cdot q^4$

3. Область применимости  $q \leq .13 \pm .01 \text{ GeV/c}$

$P \leq .157 \pm .014 \text{ GeV/c}$   $T \leq .071 \pm .010 \text{ GeV}$

## 4. Нарушение Изоспина (Highly Likely)

1. Расщепление (Splitting)  $++$   $+$   $0$   $-$

2. Смешивание (Mixing)  $1 \leftrightarrow 3$   $T_{13} \neq 0$



## 5. Намерения

1. ФА  $\pi^+ p$   $P > .8 \text{ GeV/c}$  в области  $S_{31}$  резонанса

2. Оптимизация ФА для поиска параметров смешивания (Mixing)