RESEARCH IN PROGRESS

TEST OF MULTIRESONANCE COUPLED CHANNEL PW T-MATRICES IN THREE BODY PROCESSES

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Meson-nucleon resonances

a. Motivation of search
   - the check of existing quark model predictions
   - using the obtained PWA as input for multibody processes

b. Status
   - at least 5 analyses and corresponding number of resonance parameter sets

c. Perspective (Future)
   Finding a single consistent set

CHOSEN PROCESS
pp-ppη

Check

Does different PWAs give different cross sections ?

Answer

! NO !

Pittsburg and Zagreb amplitudes give almost the same cross sections within the same model **in spite of their obvious differences.**

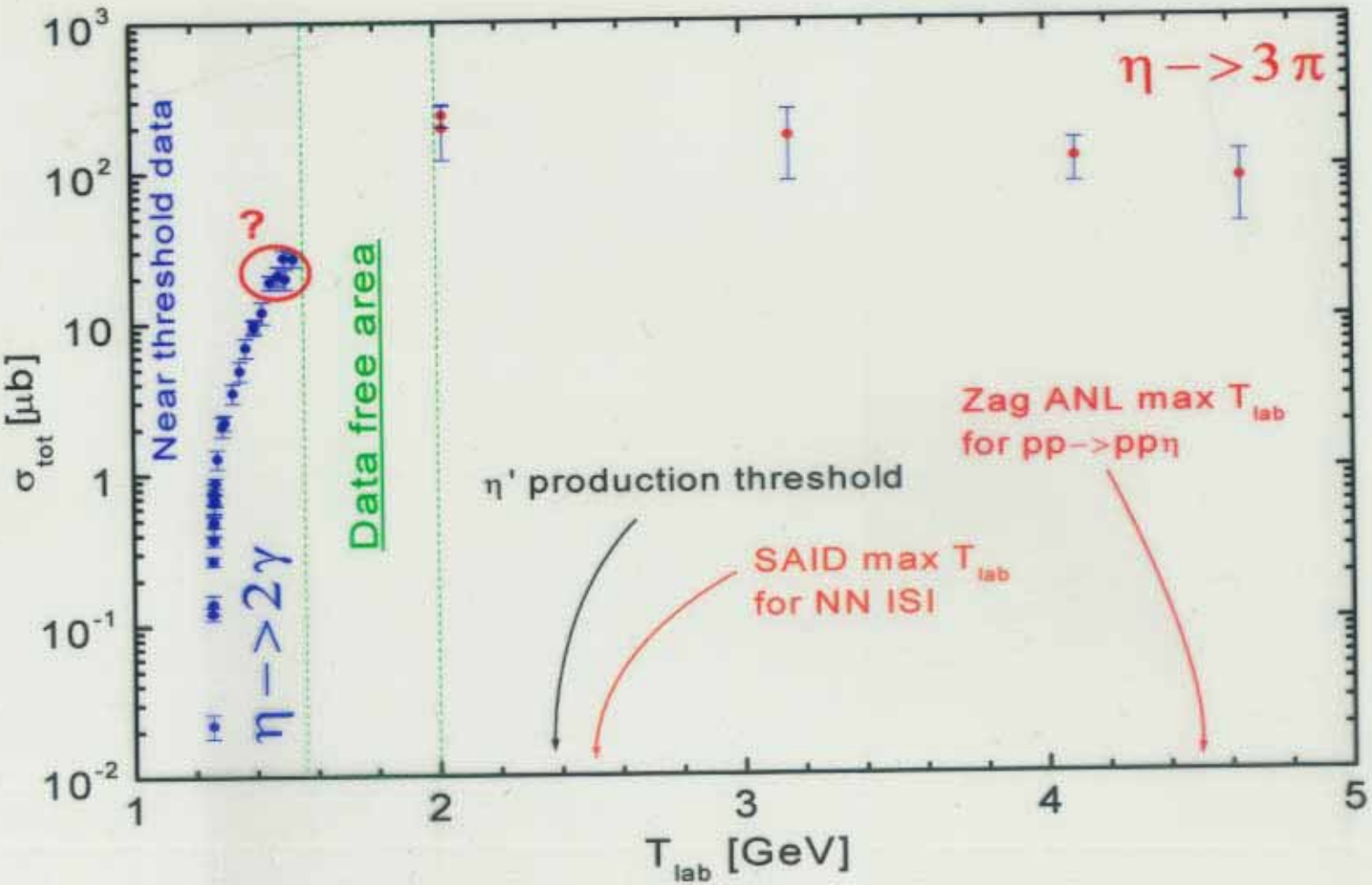
Questions

1. Do other PWAs give the same result ?

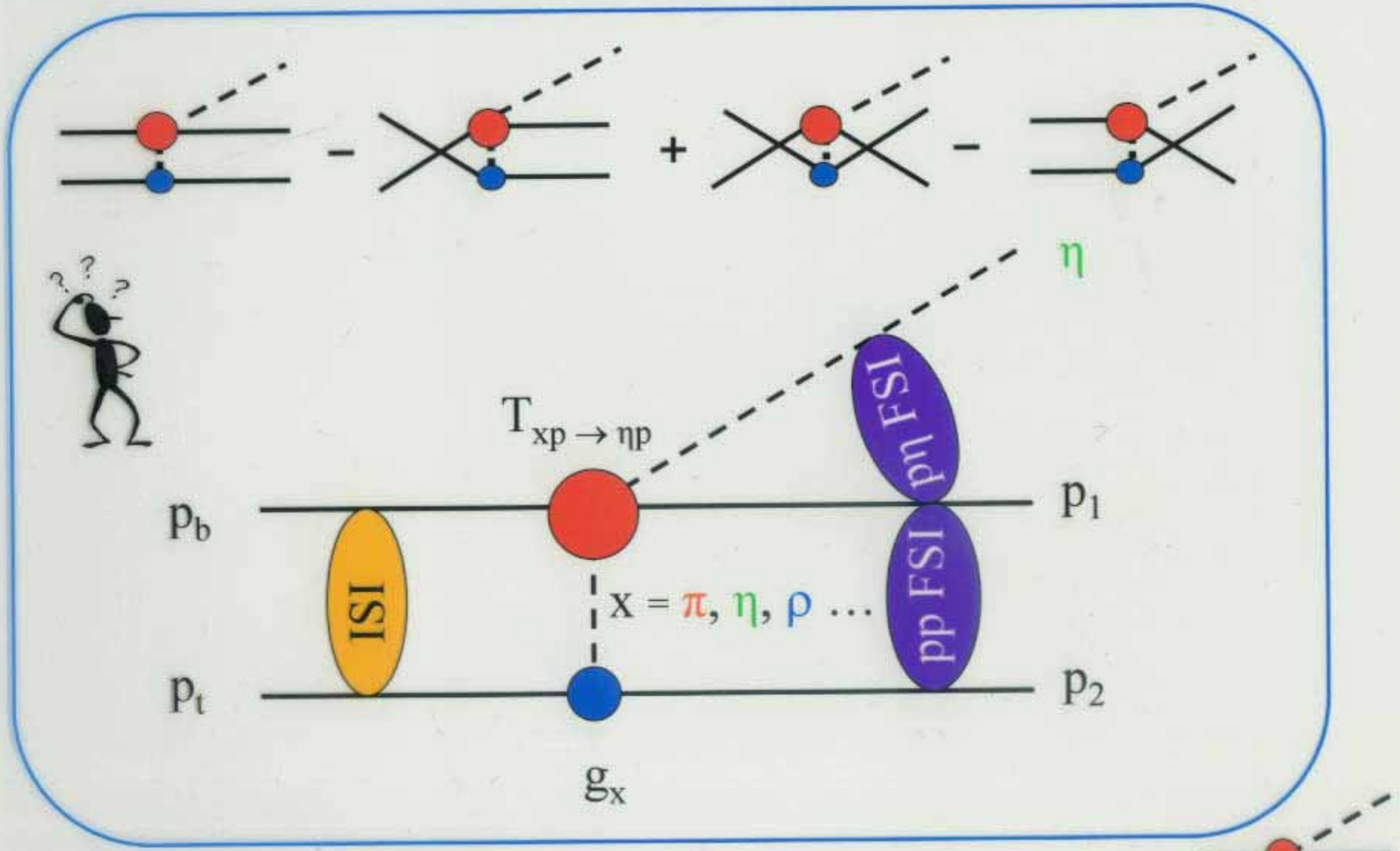
2. Can we see the differences if we include fine effects like ISI & FSI ?

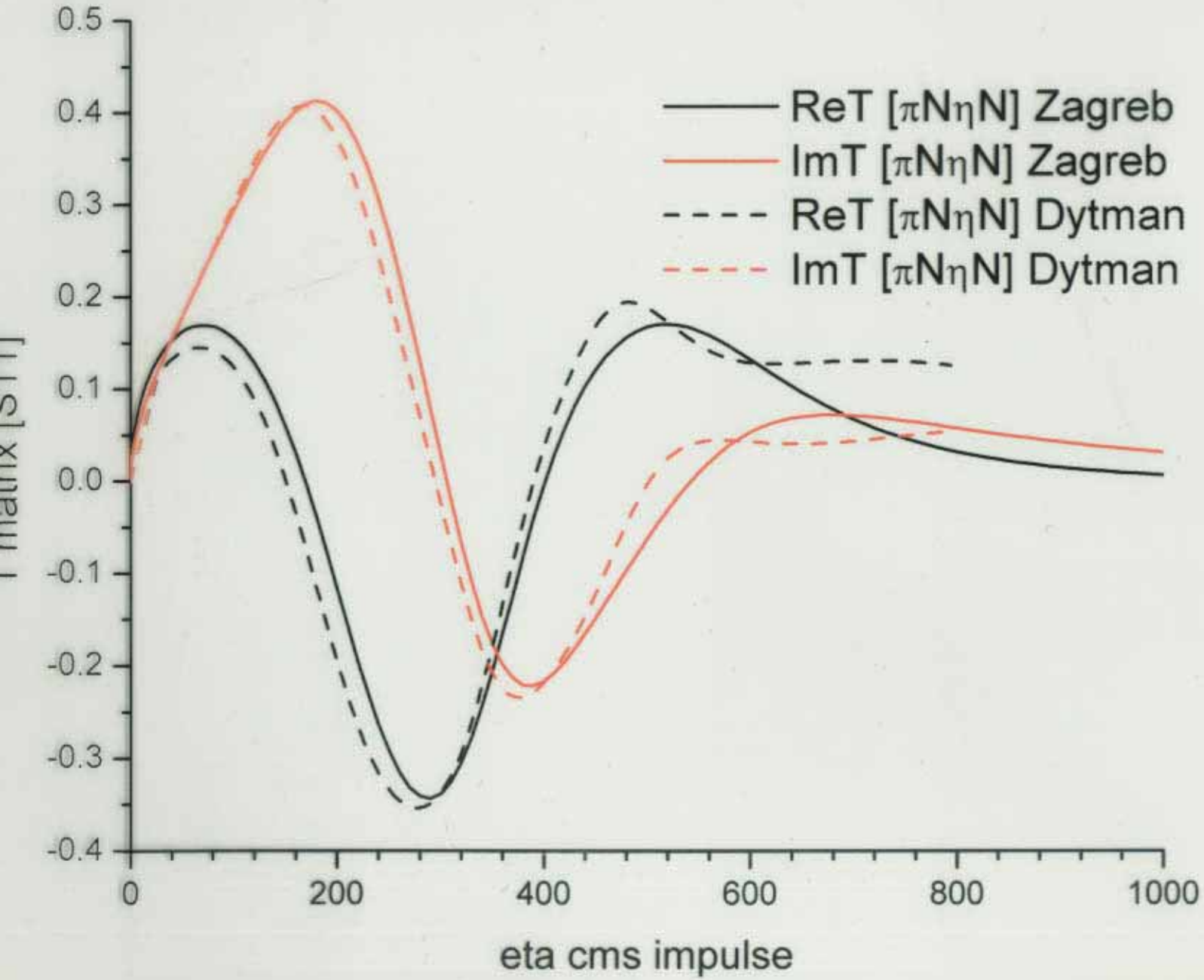
   WHY ?

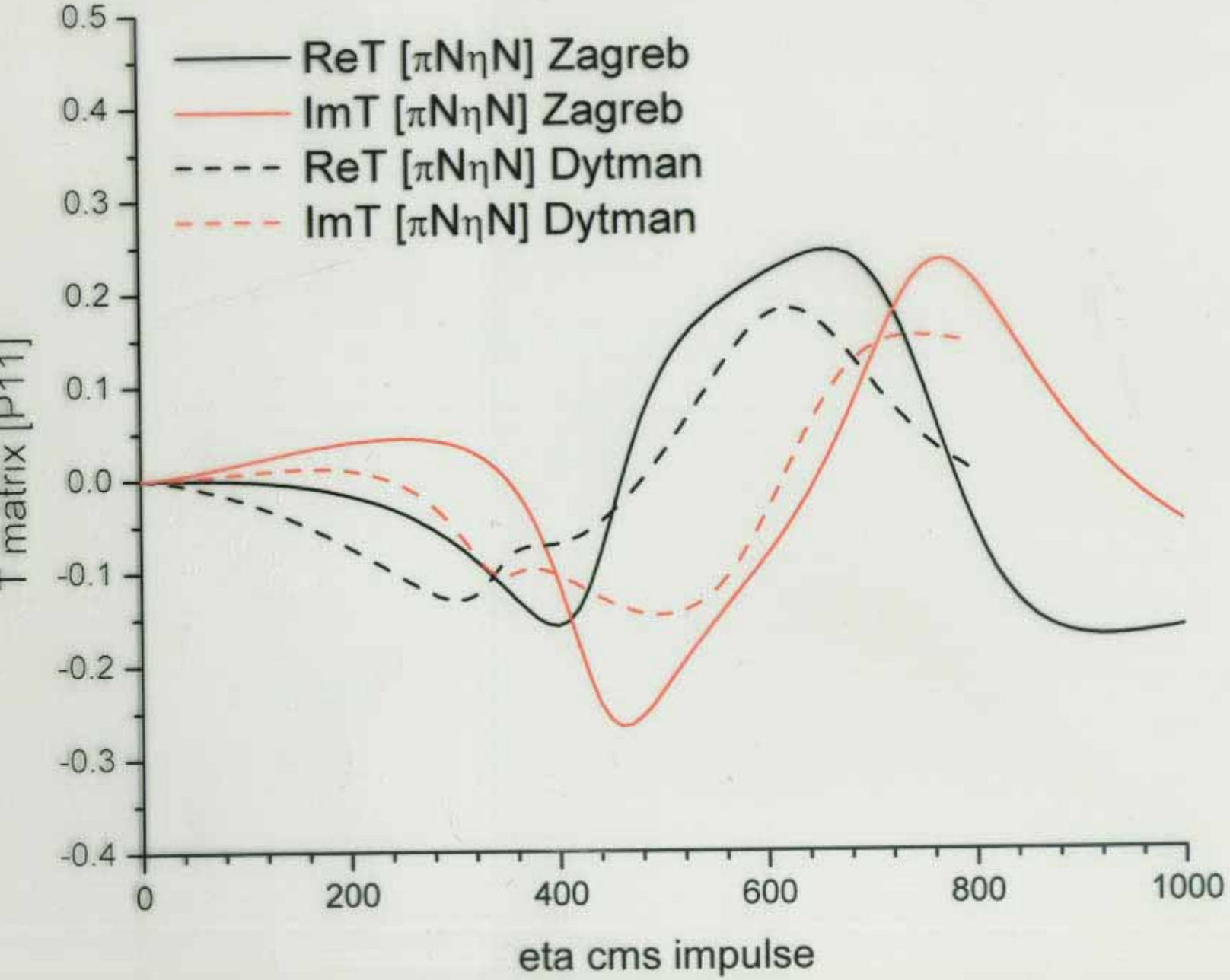
Experimental Data

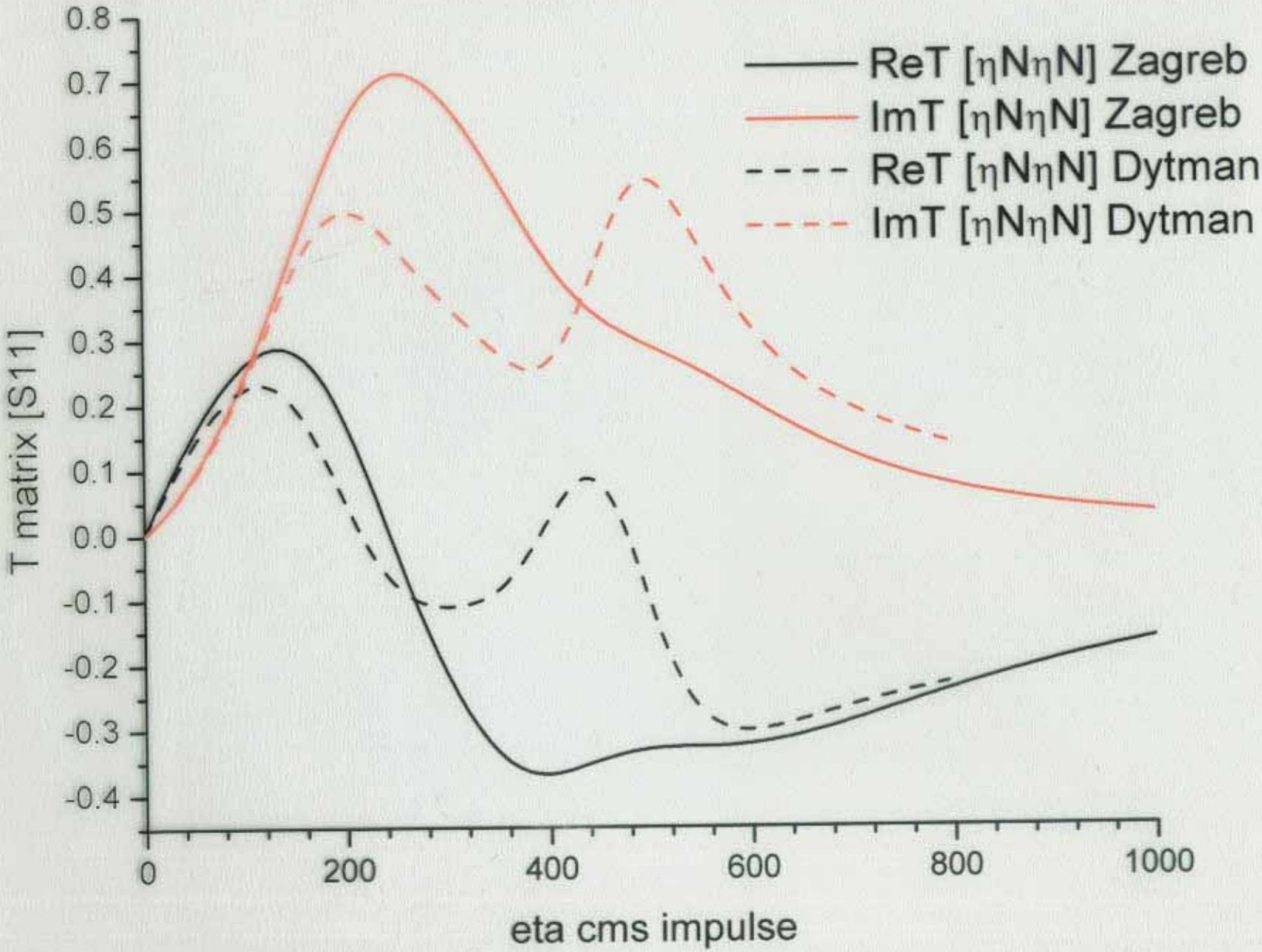


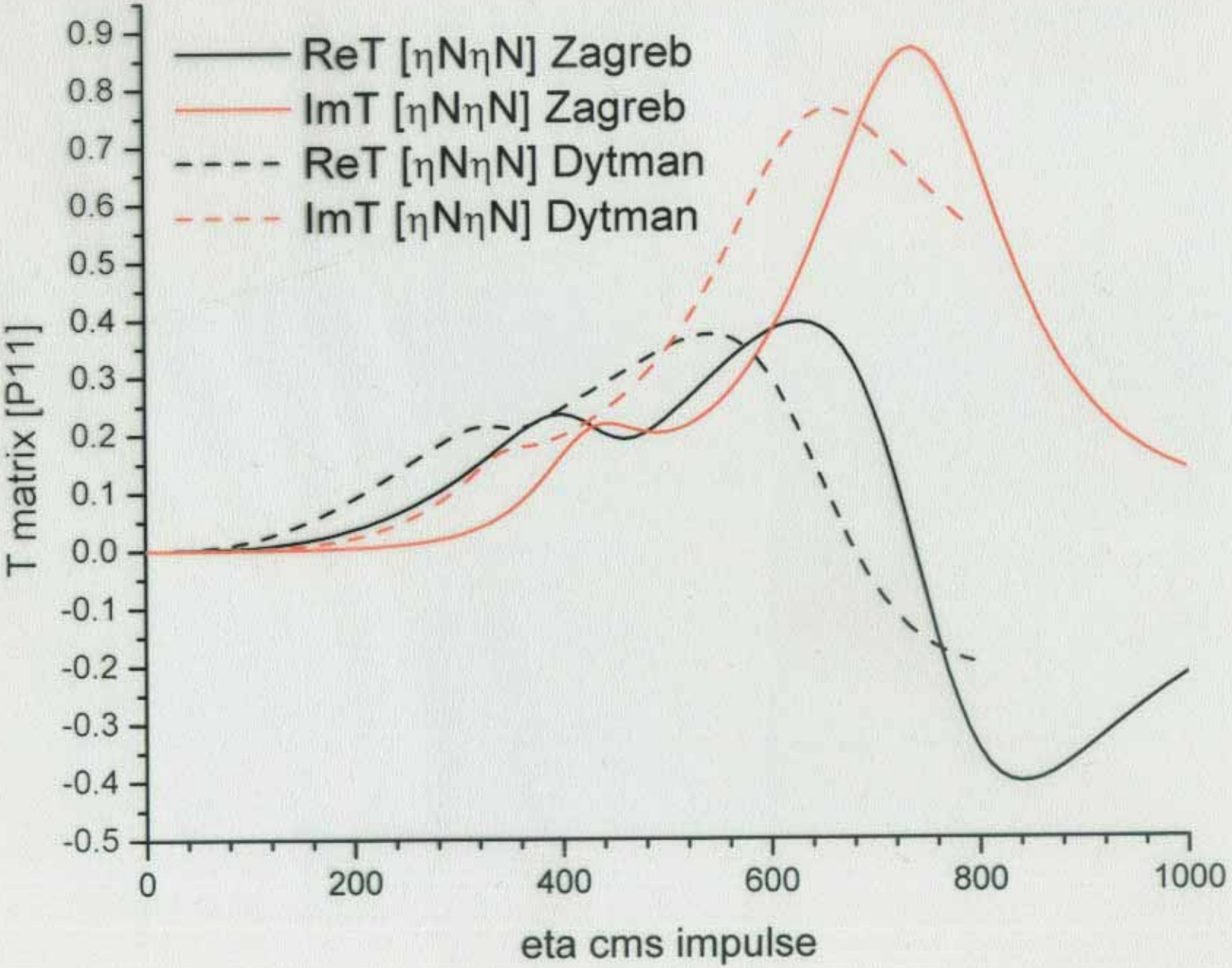
One figure instead of a lot of words ...



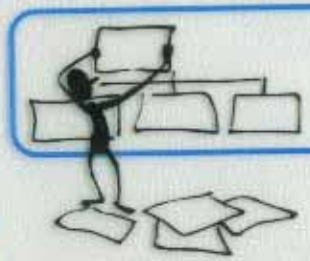

ReT [πNηN] Zagreb
ImT [πNηN] Zagreb
ReT [πNηN] Dytman
ImT [πNηN] Dytman
T matrix [fm]
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
0
200
400
600
800
1000
eta cms impulse

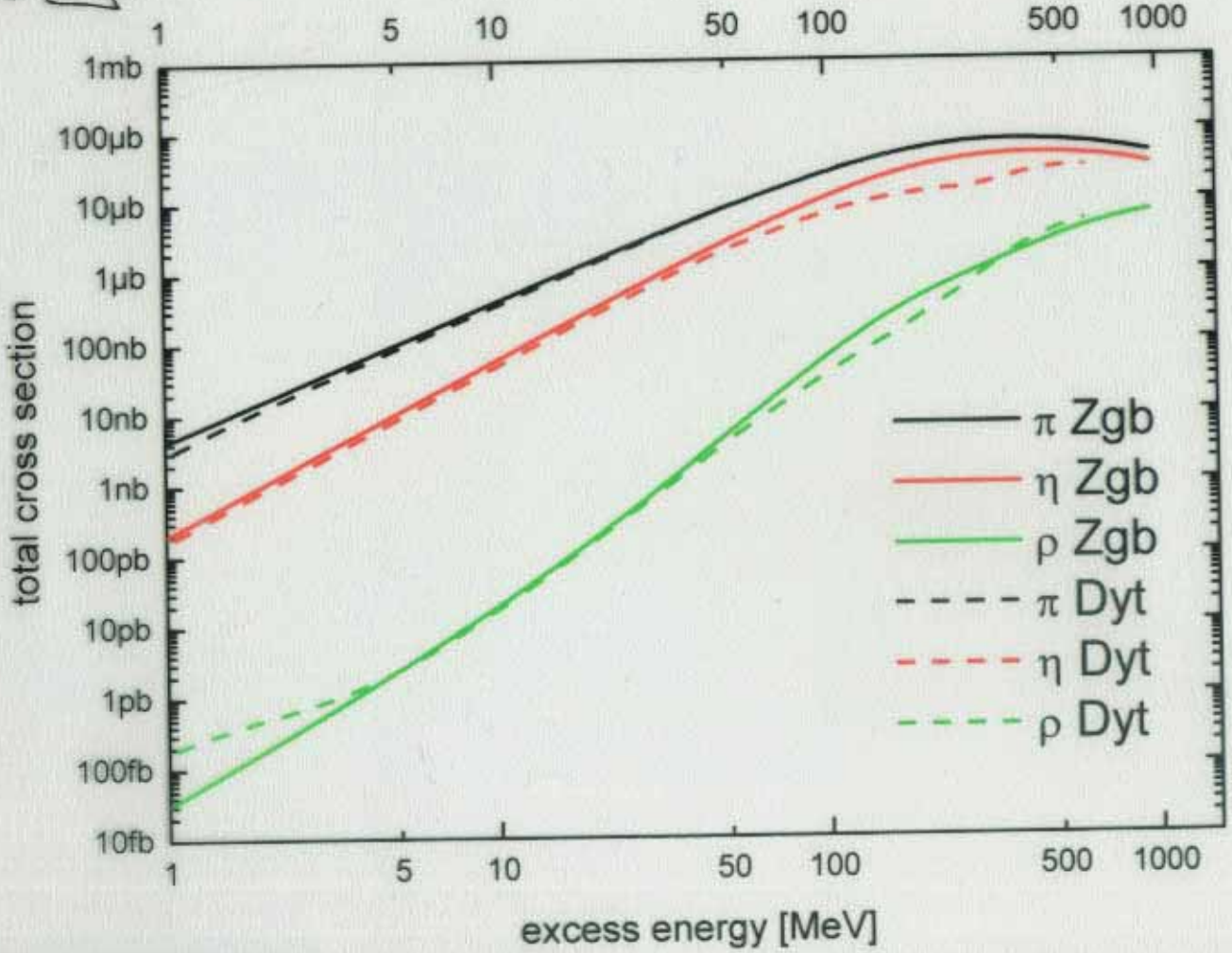

ReT [πNηN] Zagreb
ImT [πNηN] Zagreb
ReT [πNηN] Dytman
ImT [πNηN] Dytman
T matrix [P11]
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
0
200
400
600
800
1000
eta cms impulse


ReT [ηNηN] Zagreb
ImT [ηNηN] Zagreb
ReT [ηNηN] Dytman
ImT [ηNηN] Dytman
T matrix [S11]
eta cms impulse
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
0
200
400
600
800
1000

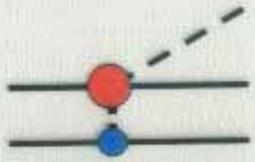

ReT [ηNηN] Zagreb
ImT [ηNηN] Zagreb
ReT [ηNηN] Dytman
ImT [ηNηN] Dytman
T matrix [P11]
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
-0.2
-0.3
-0.4
-0.5
0
200
400
600
800
1000
eta cms impulse

Different T matrices

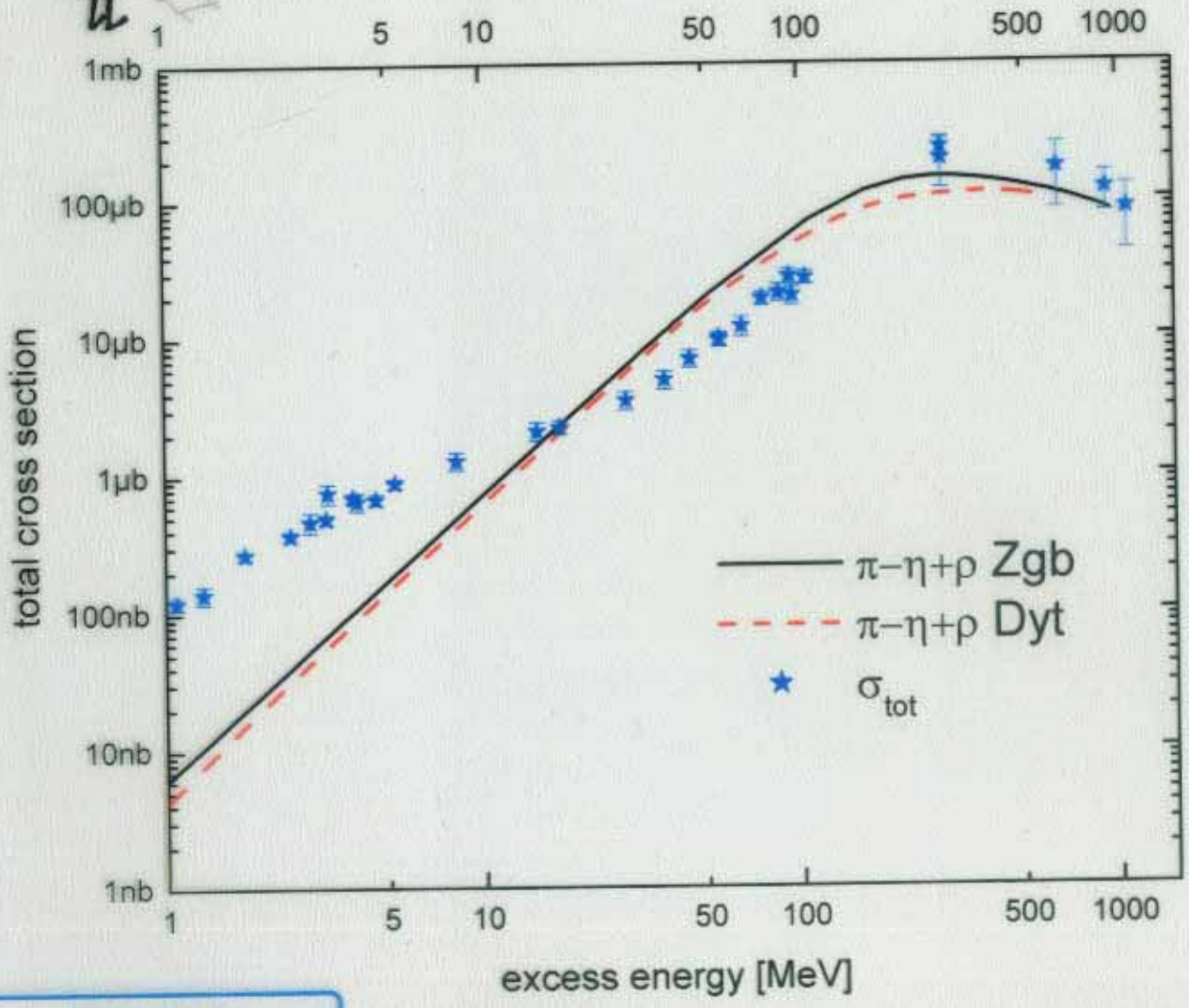


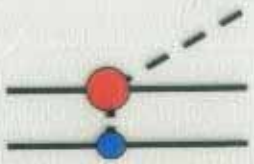


Steven Dytman, private communication



Agreement

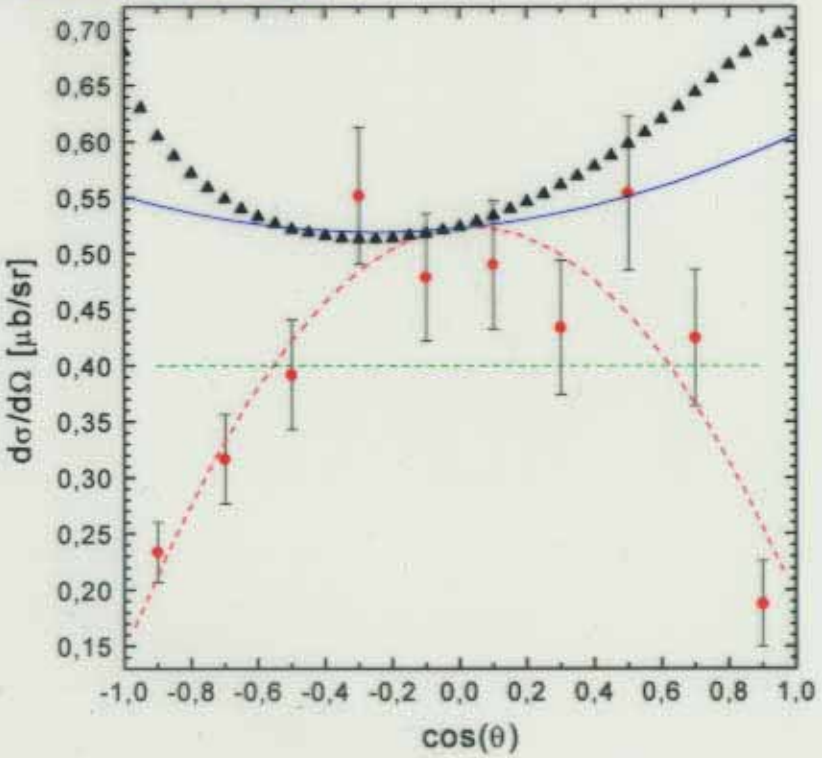

1
5
10
50
100
500
1000
1mb
100μb
10μb
1μb
100nb
10nb
1nb
total cross section
π−η+ρ Zgb
π−η+ρ Dyt
σtot
excess energy [MeV]



R7: H.Calen *et al*

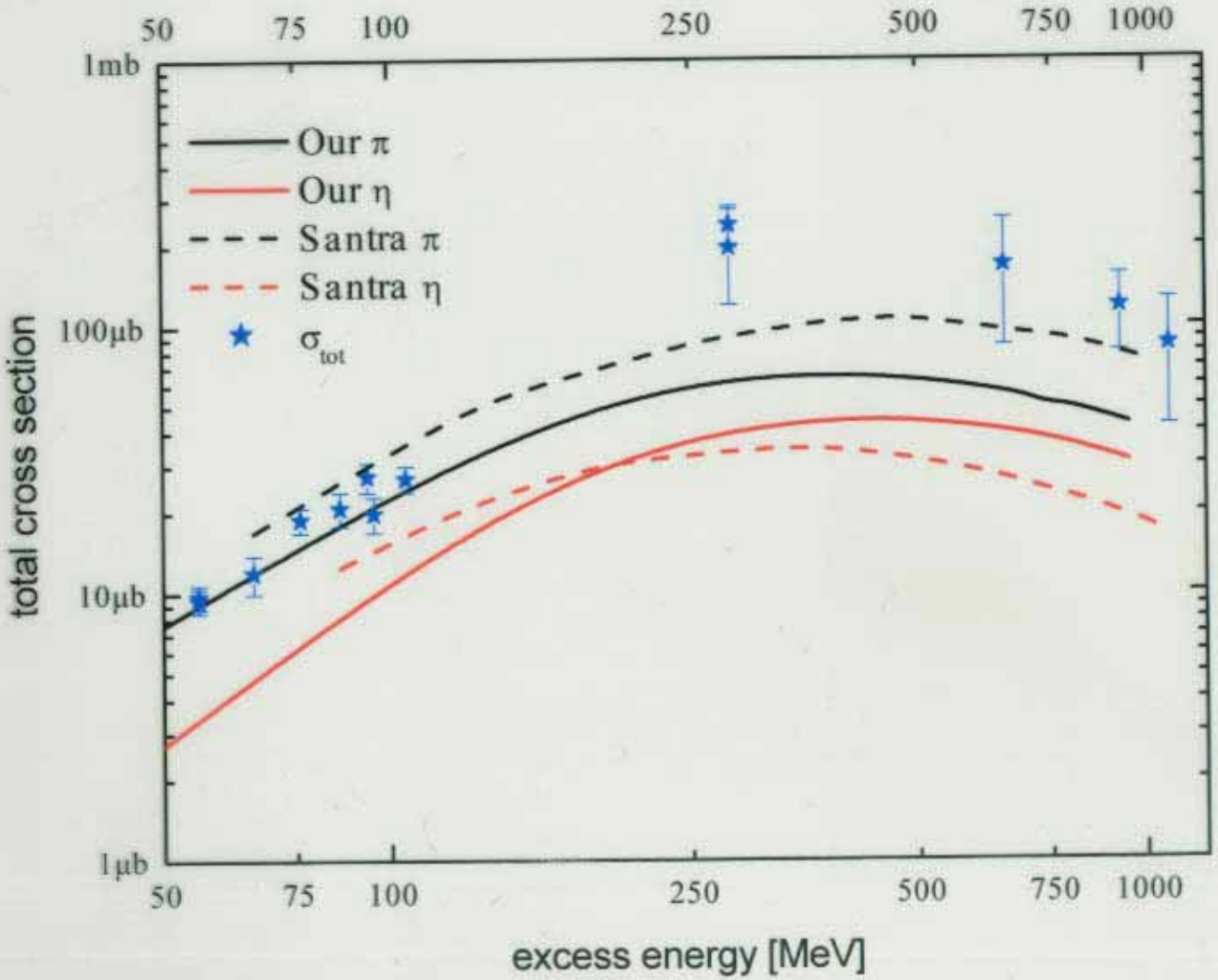
Differential cross section - $d\sigma/d\Omega$ at 37 MeV excess energy.

Why is the slope different for $\pi p \rightarrow \eta p$ from the $pp \rightarrow pp\eta$



* H.Calen et al Phys. Let. **B 458** (1999) 190.

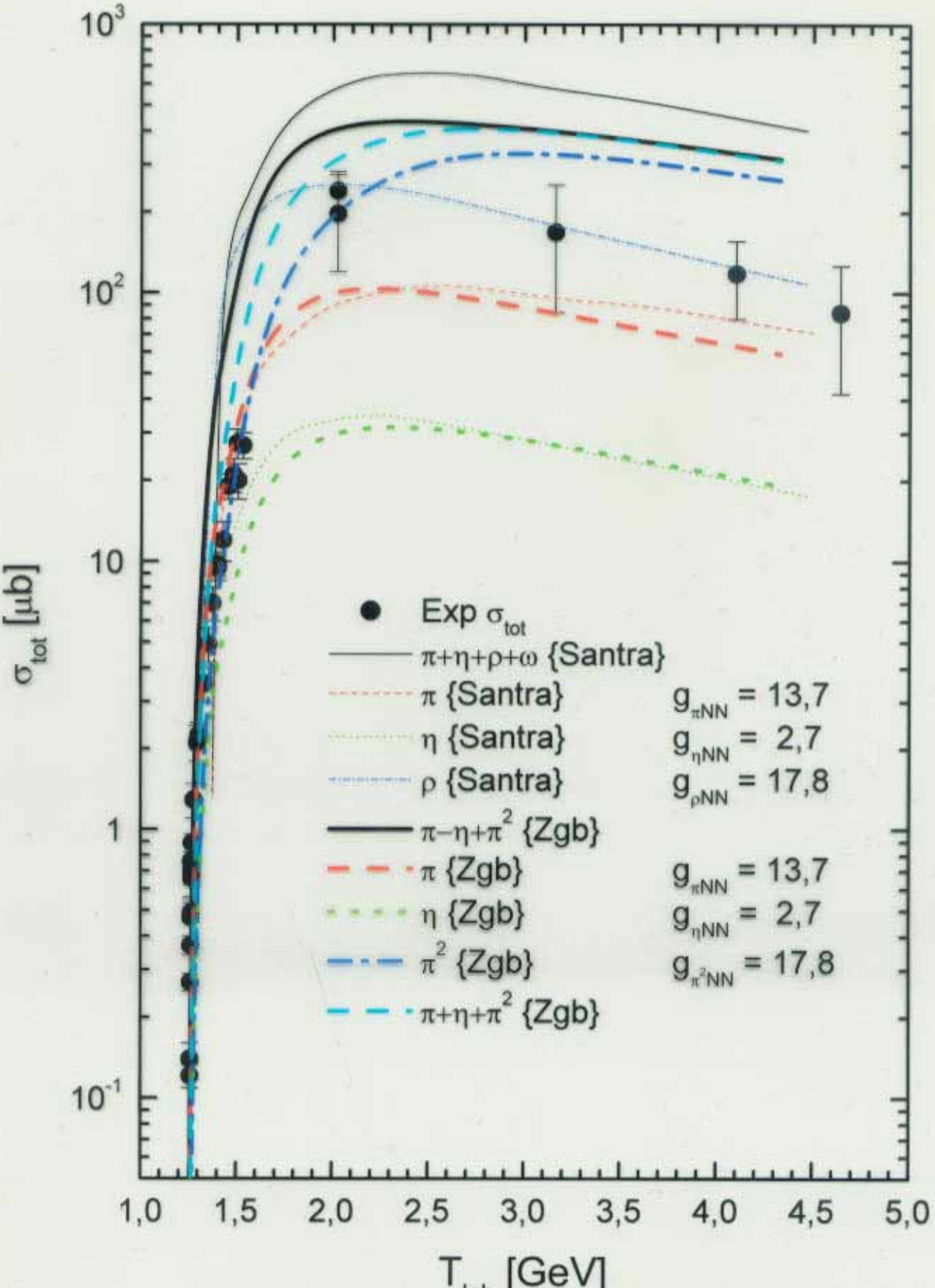
Pi and eta mesons



A.B.Santra & B.K.Jain, Nucl. Phys. **A634** (1998) 309.

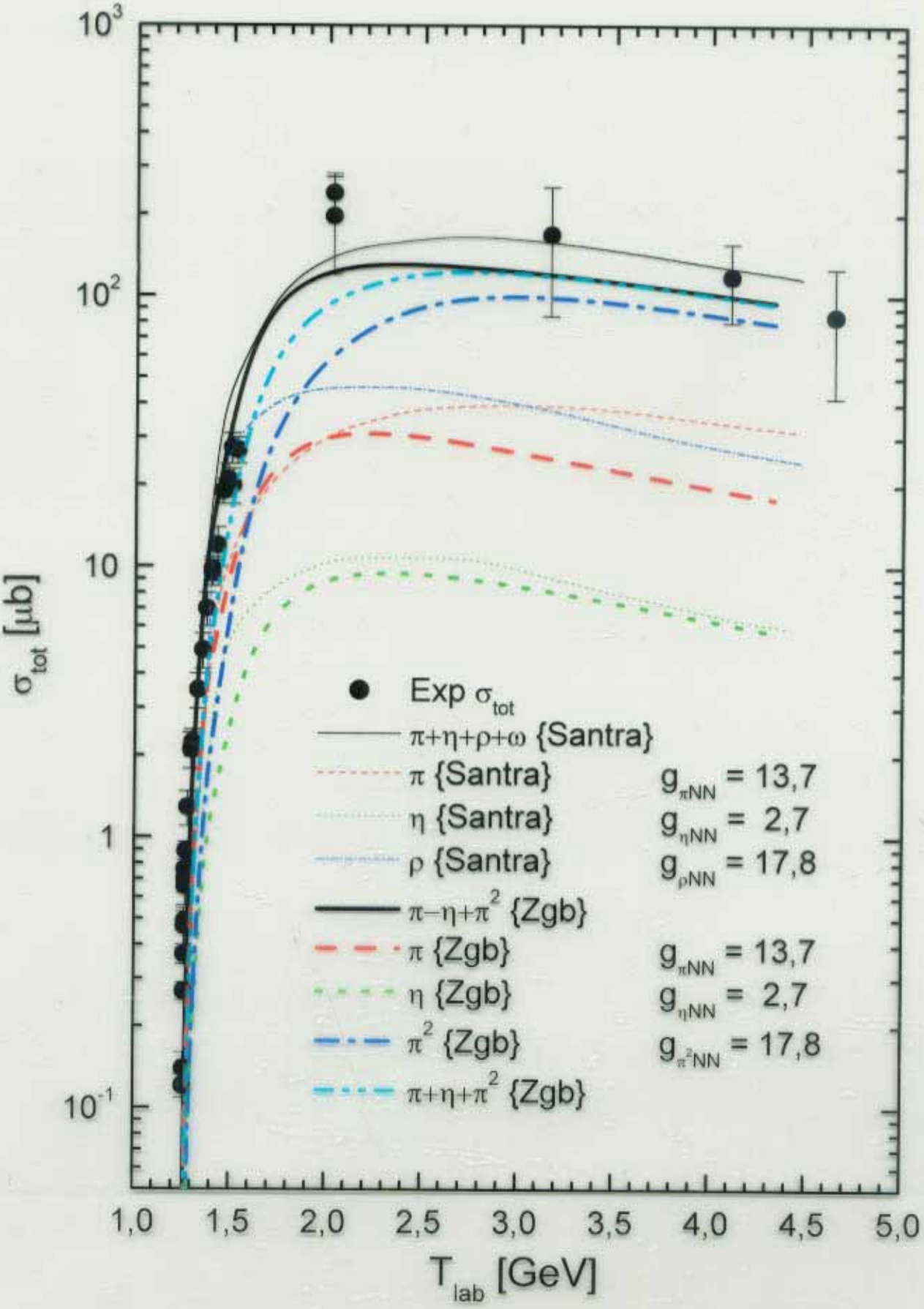
A.B.Santra and B.K.Jain

Without ISI and FSI

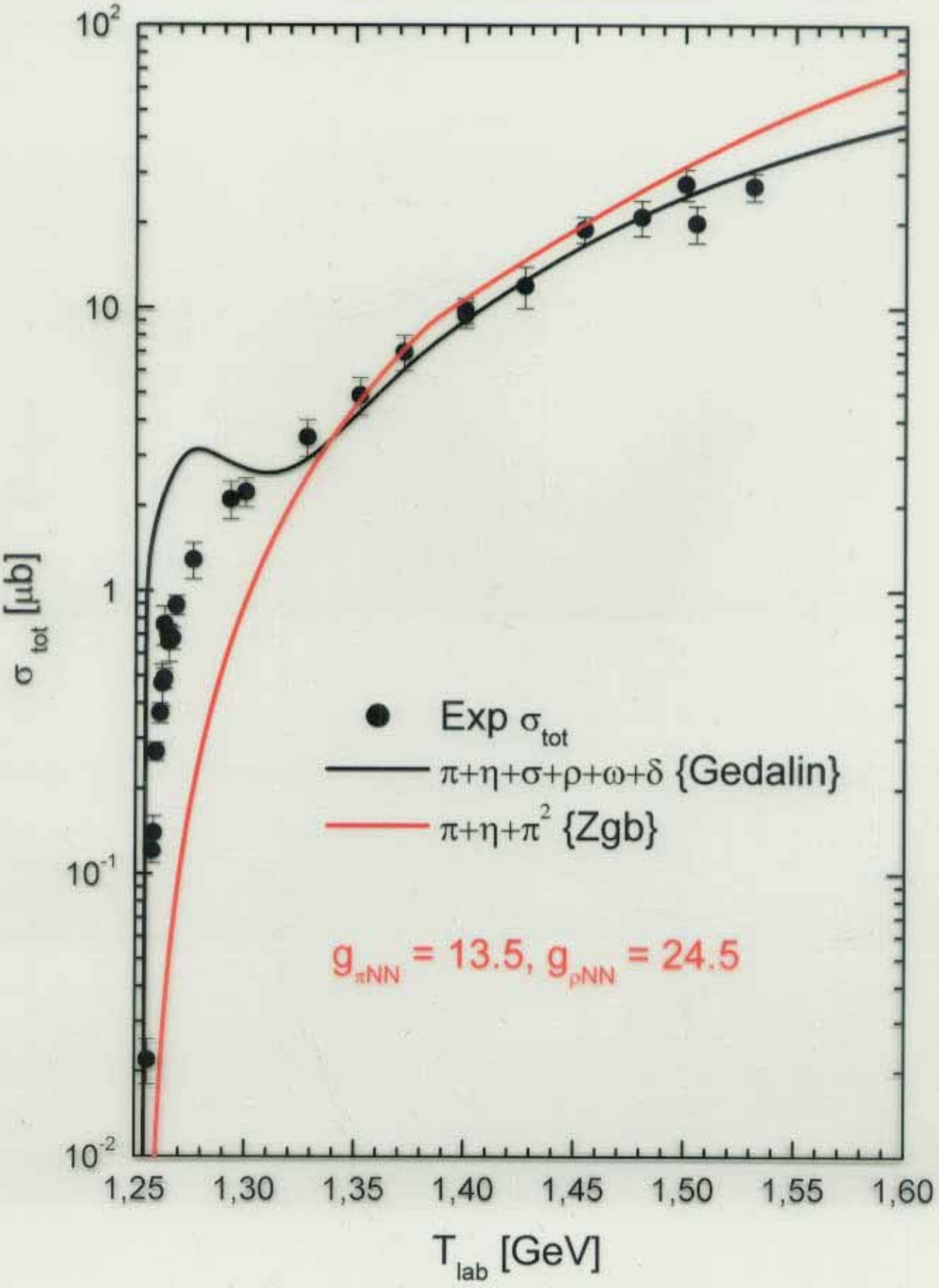


A.B.Santra and B.K.Jain

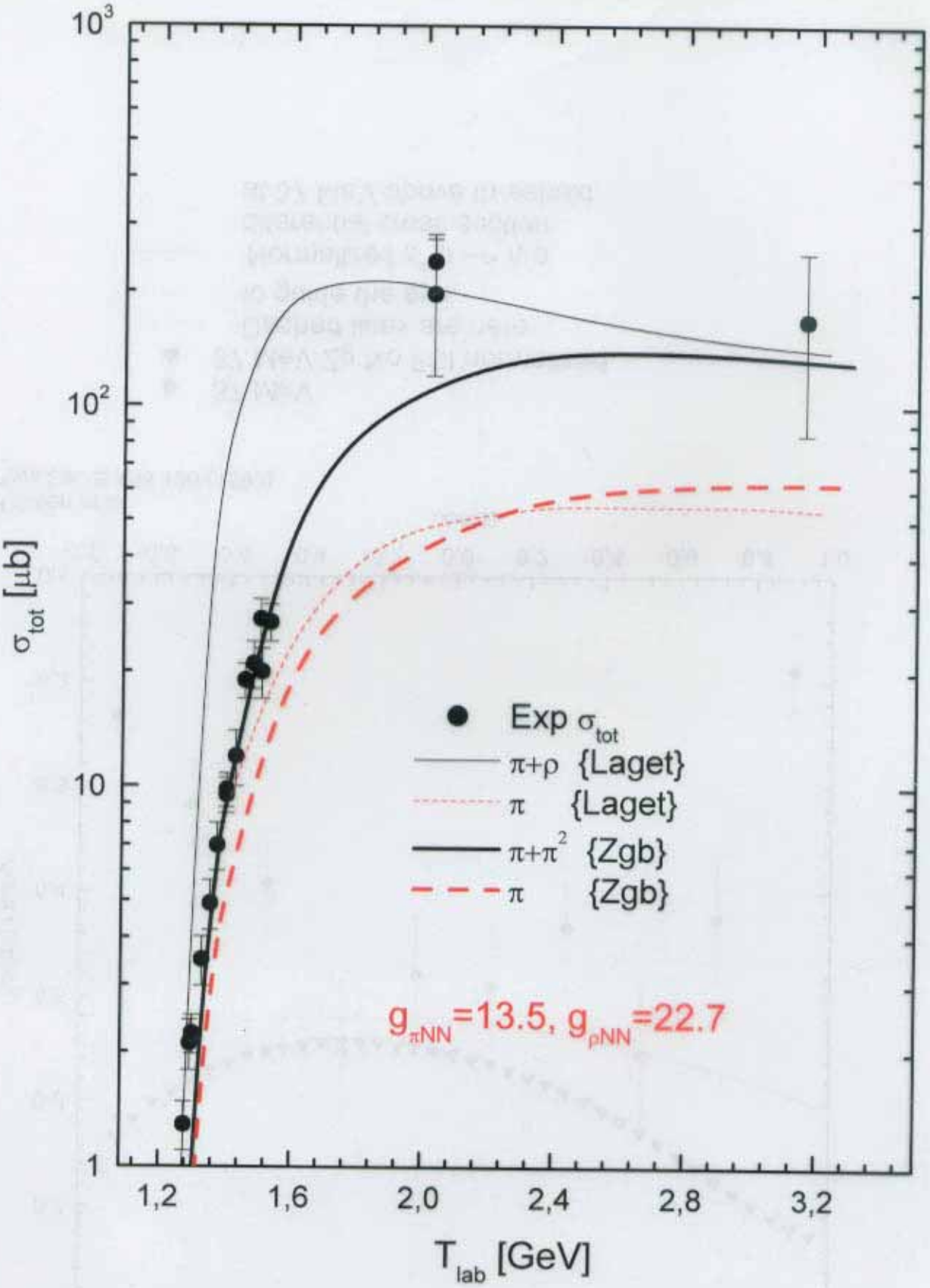
DWA



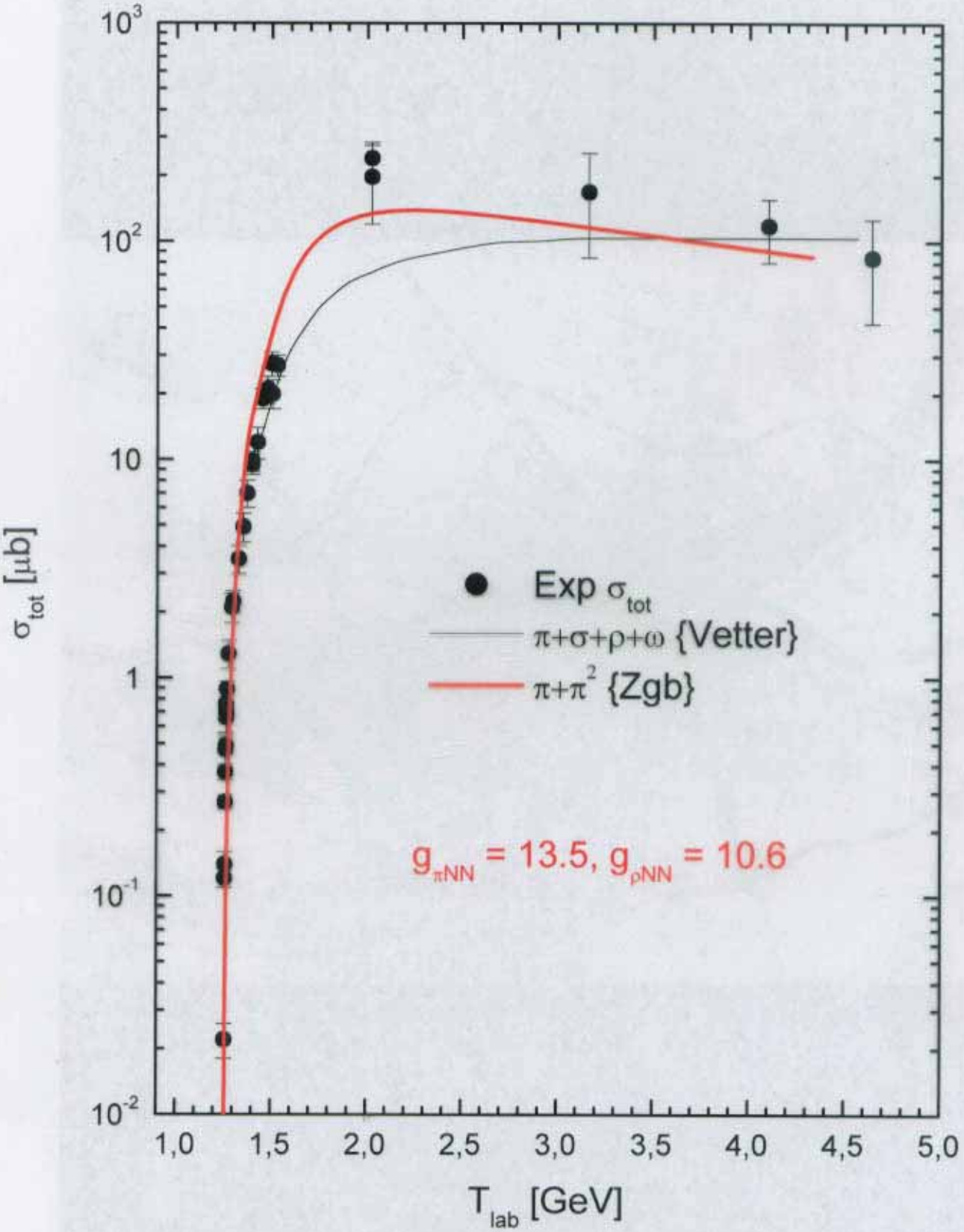
Gedalin et al



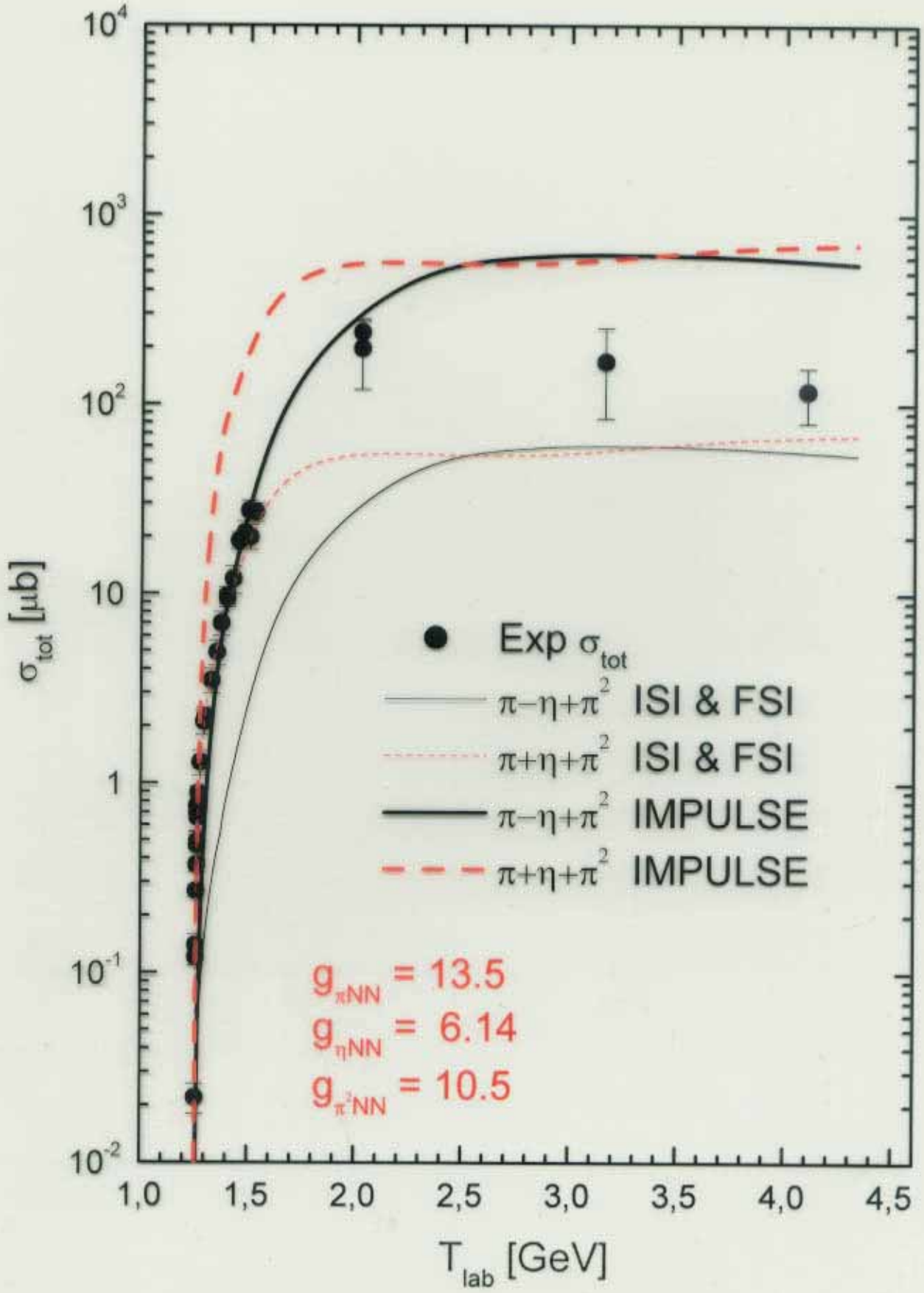
J.M.Laget et al



T.Vetter et al



Zagreb Model



Answers

The present model is too crude so the two body input does not play a significant role.

Example: different models with different two body input give the same agreement with the experiment.

RESULTS ARE JUST PRELIMINARY !