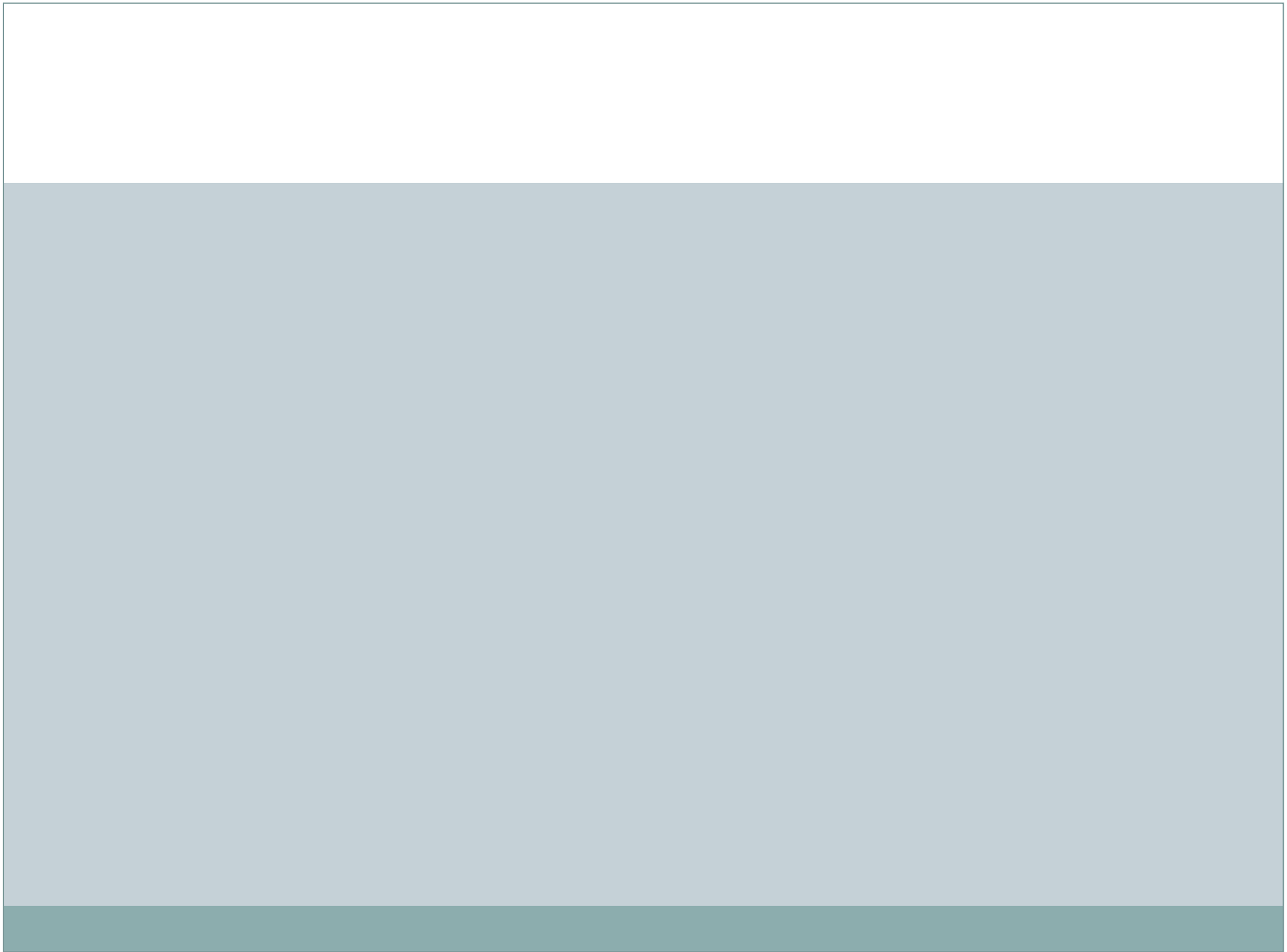


# Computational Modeling Decay Spectroscopy



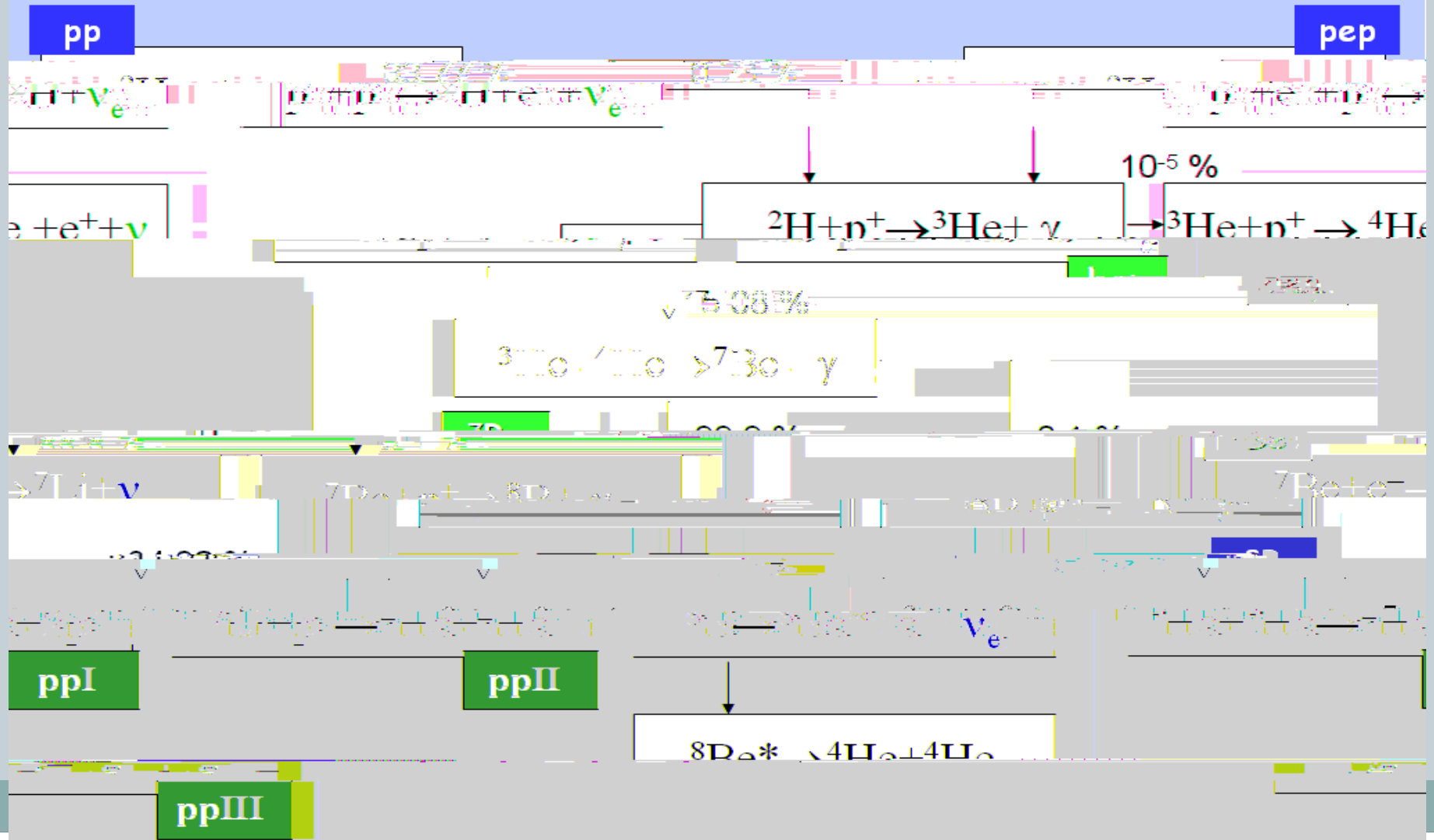
**40** , **00**  
**1**







# Motivation Solar Reactions





# Motivation











# Physics Package Used



Electron Gamma Shower national research council  
(Canada) (EGSnrc)



# Monte Carlo Techniques (2)



Each particle has a chance of undergoing various interactions

Pair production, Compton scattering, etc.

A random number is generated and corresponds to an outcome

Any extra particles created are also followed to the cut off energy

To get high accuracy we run lots of particles

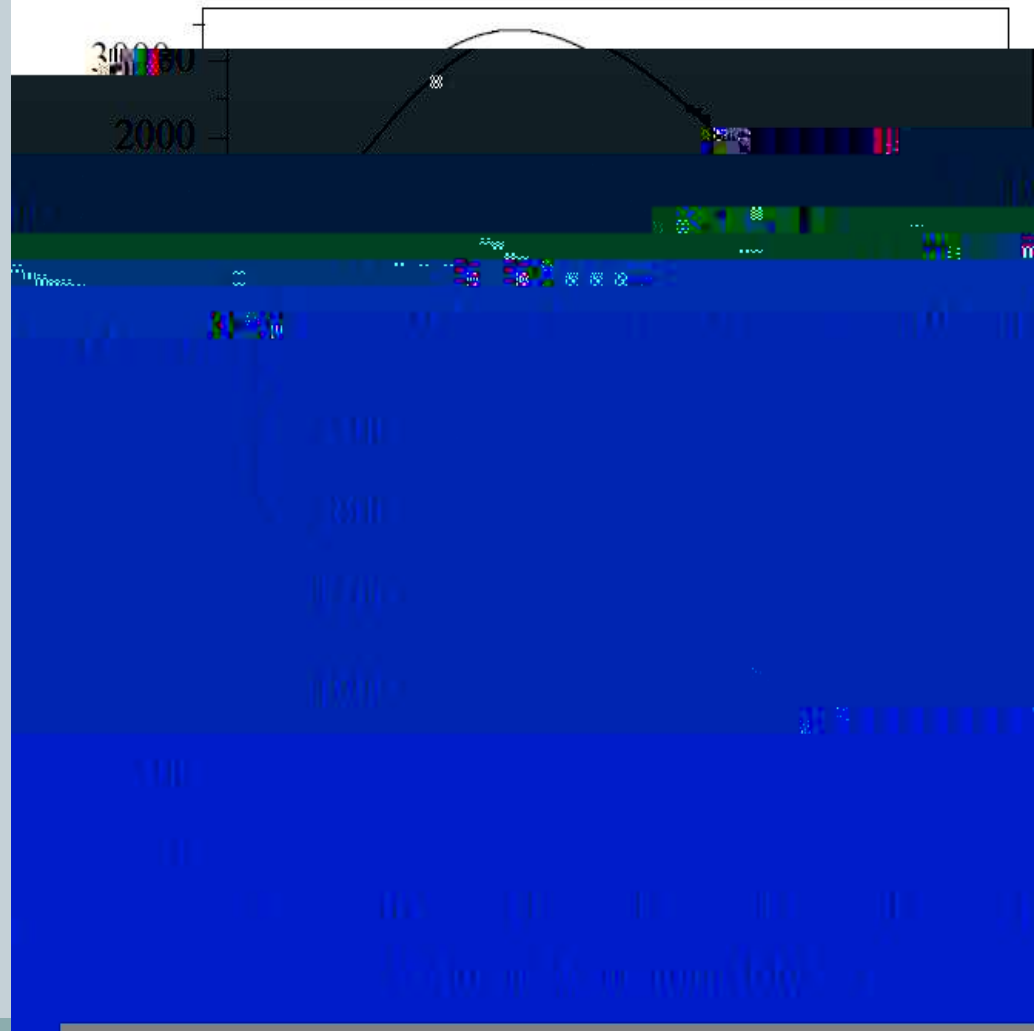
Our simulations require  $10^7$  to  $10^8$  source particles

# Past Work



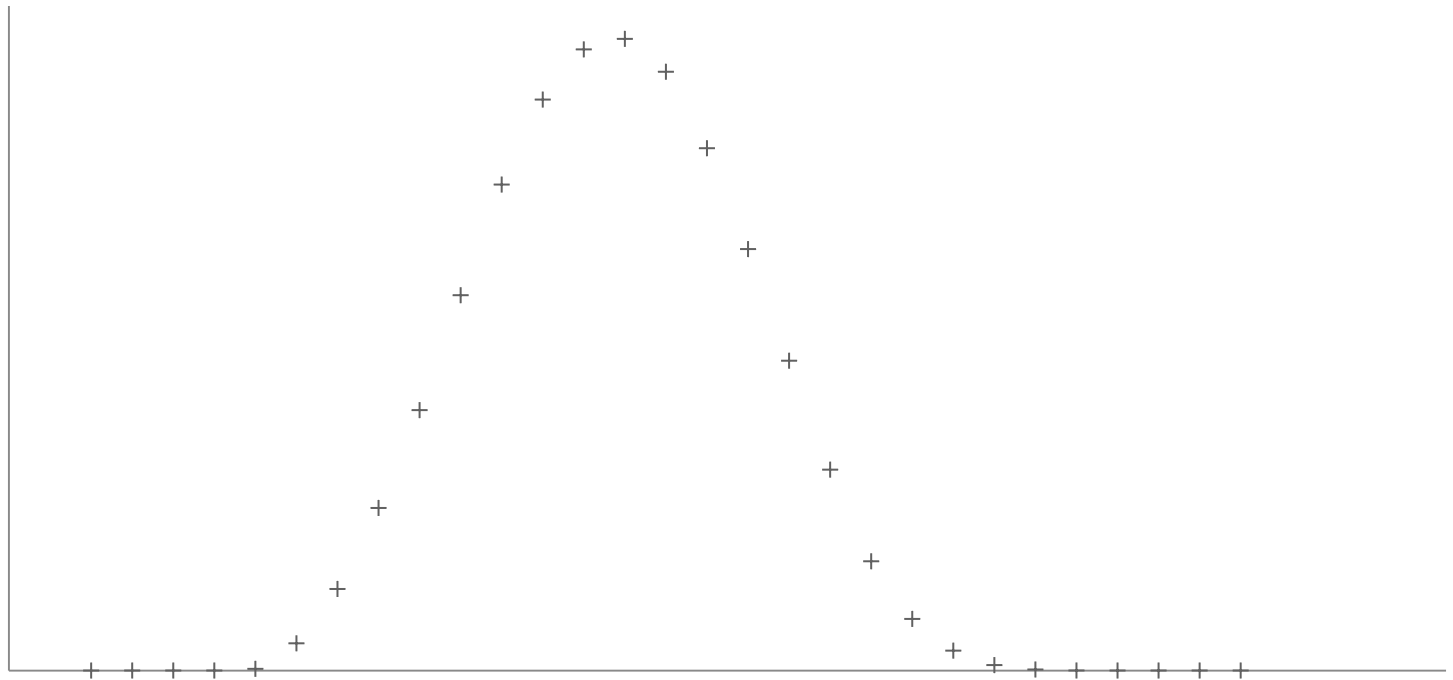
## Past Measurement

W.T. Winter



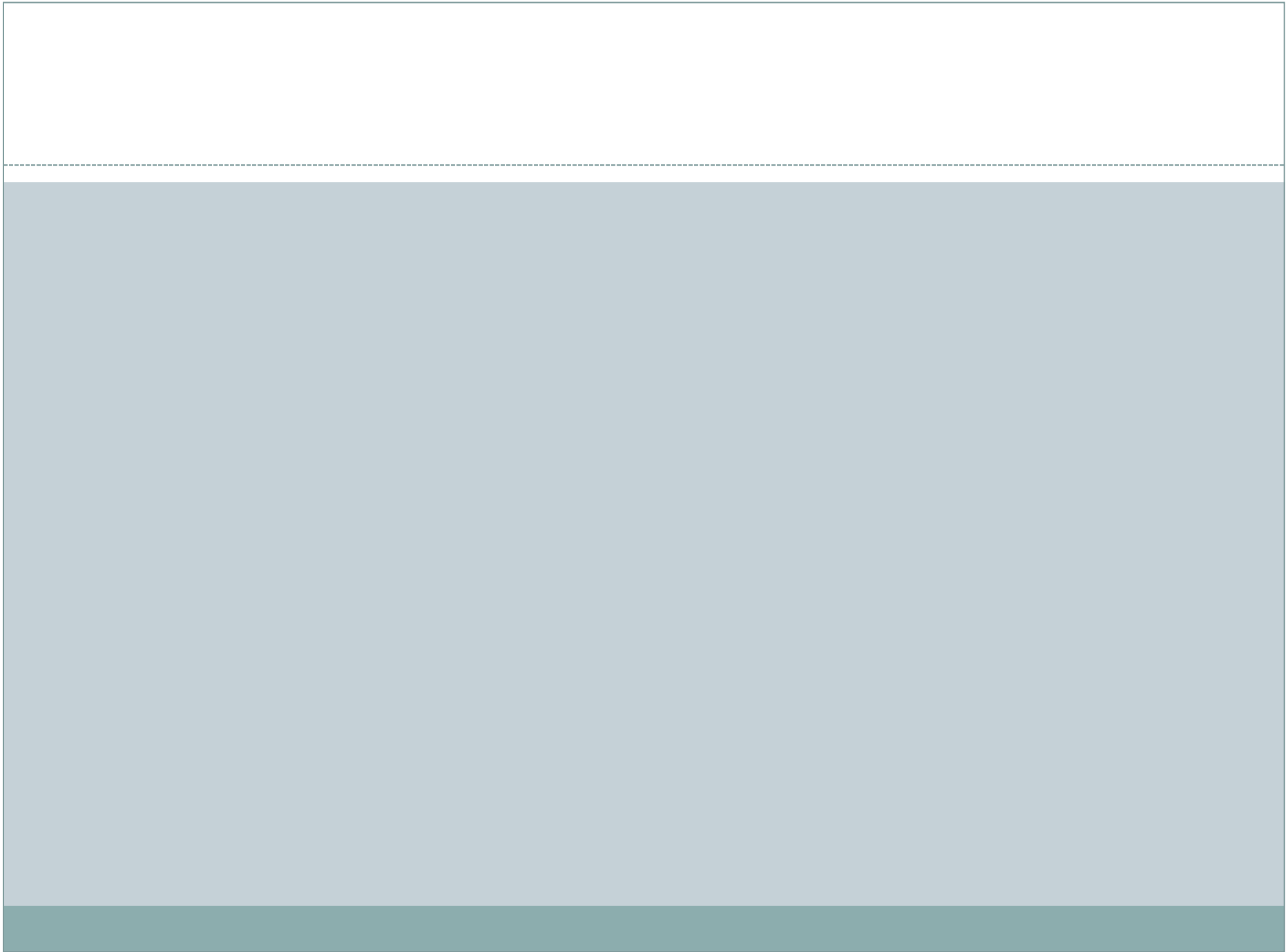


# EGS Modeling



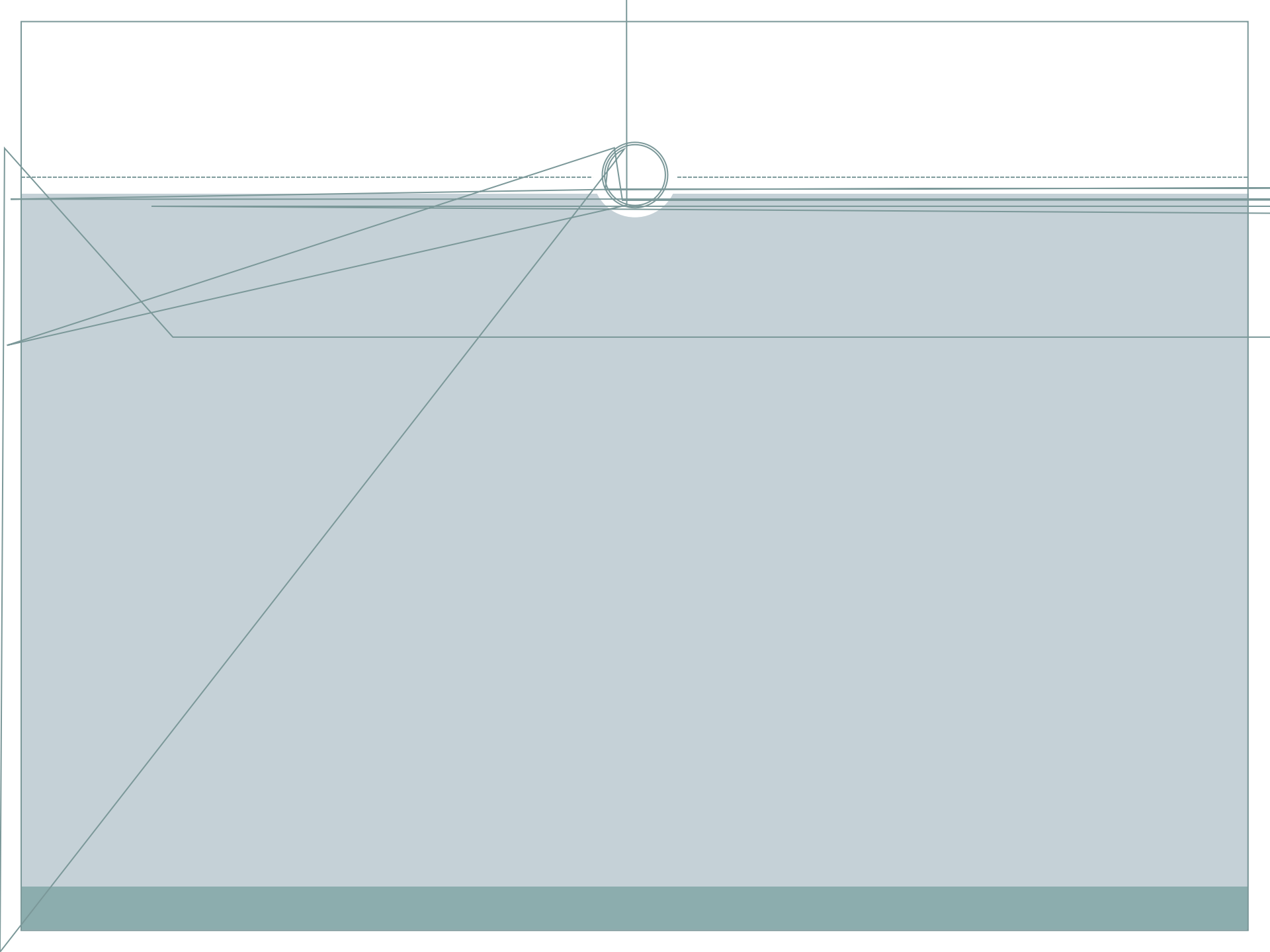
Response Curve at 12 MeV/c











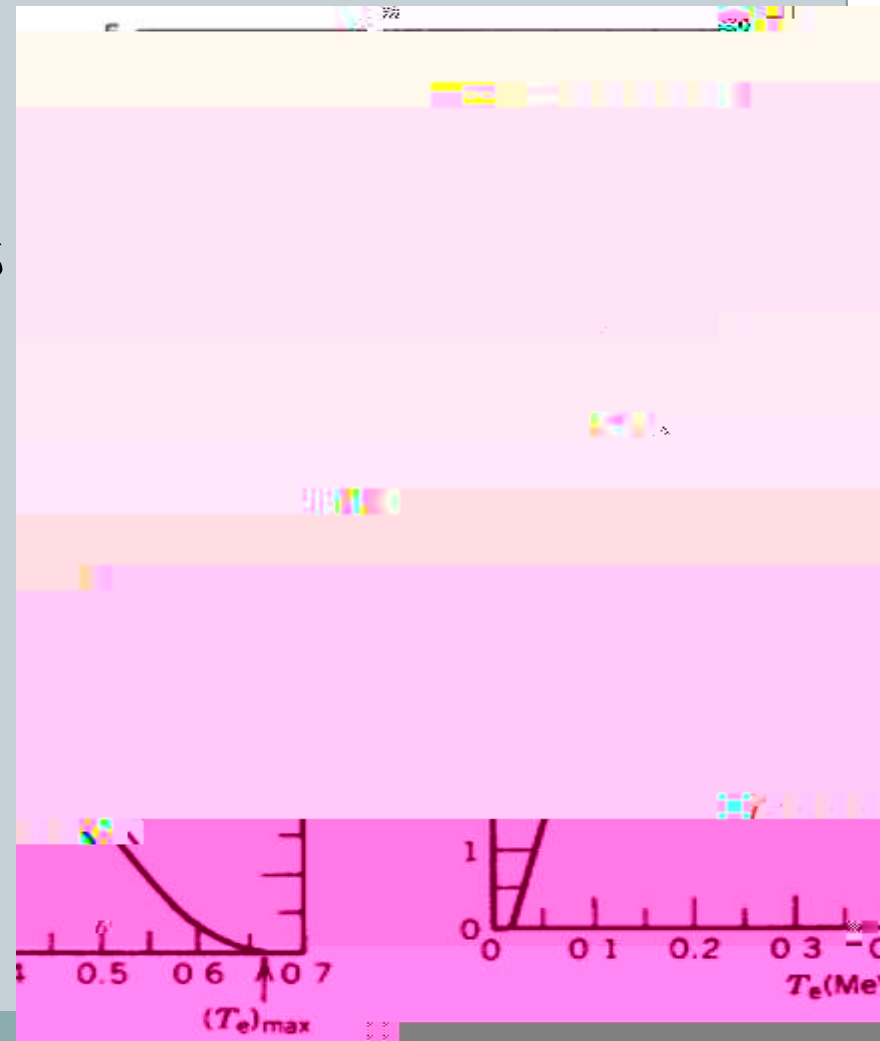
# The Fermi Function

Based on Coulomb interaction between emitted particle and positive nucleus

$$F(Z, T_e) = \sqrt{A + \frac{B}{T_e - 1}}$$

$$A = mZ + K$$

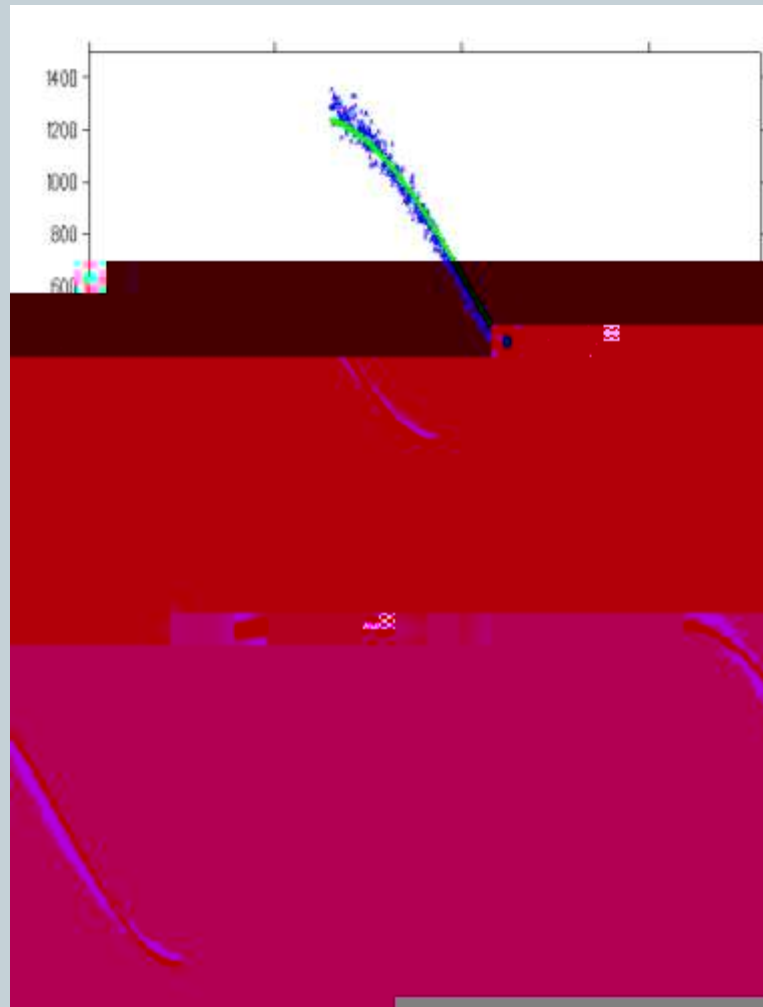
$$B = aZ e^{bZ}$$



# Comparison of Fits



With Fermi:



Allowed :

Y-Axis: Counts  
X-Axis: MeV

