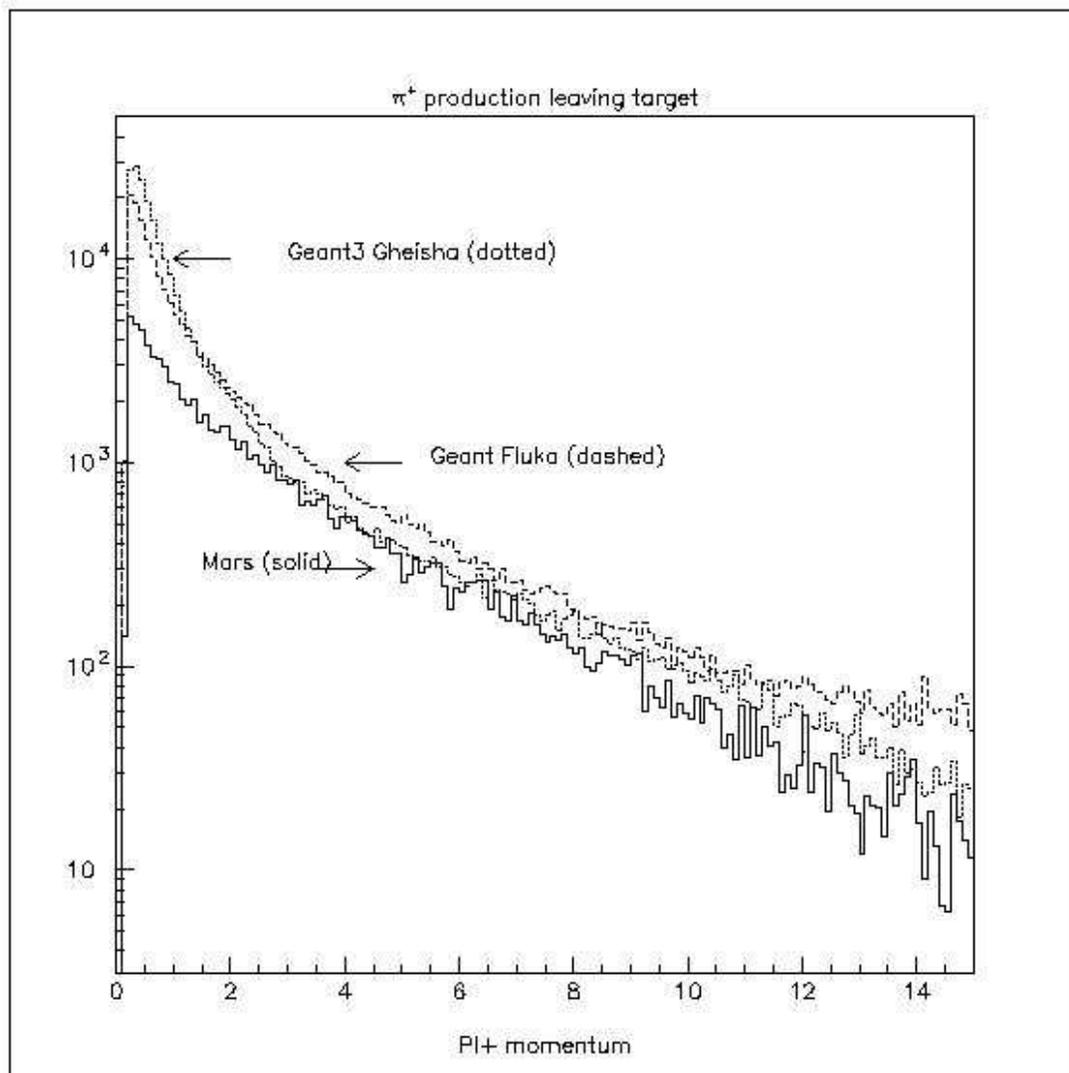


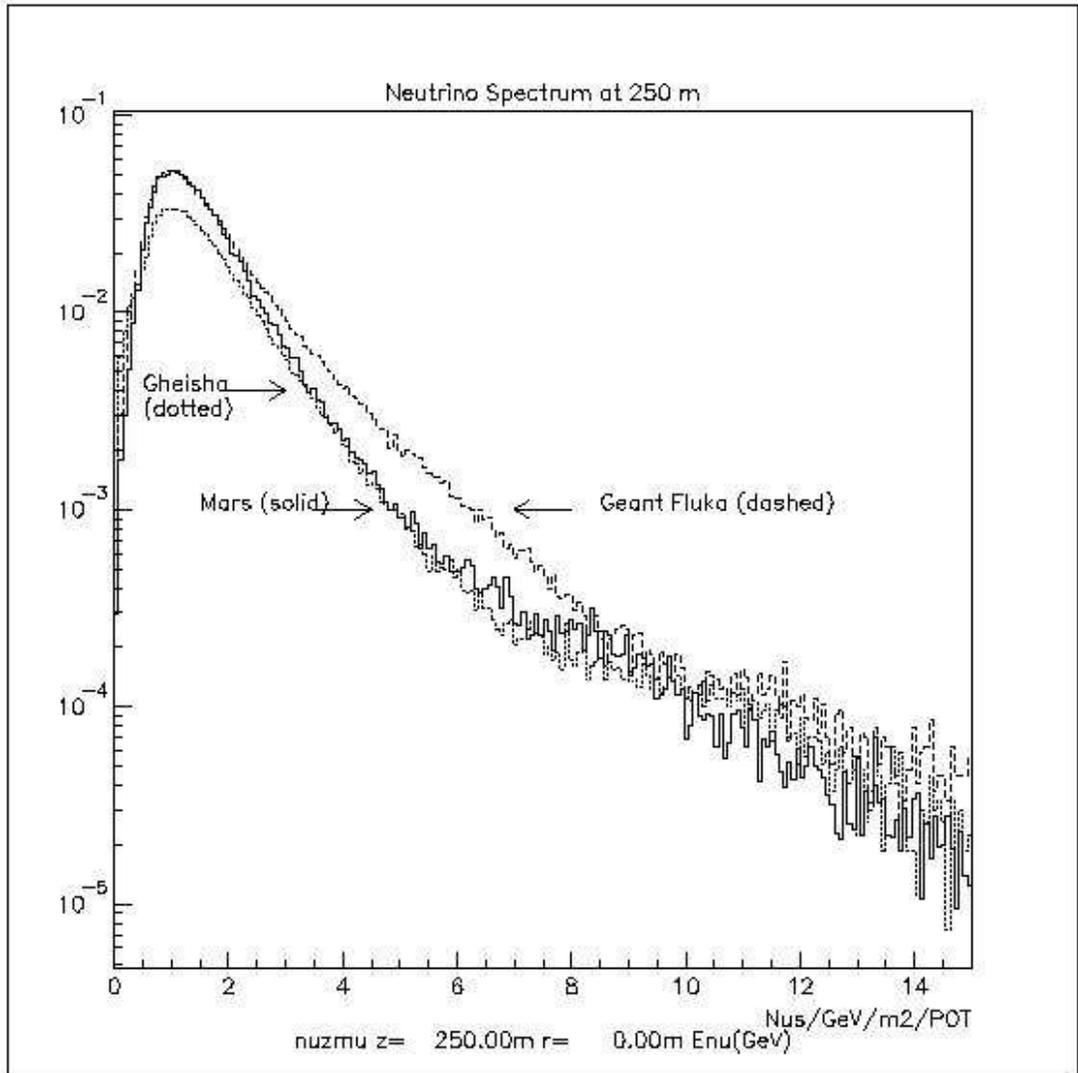
Comparison of Particle Production Models for Neutrino Fluxes

J. Gallardo, S. Kahn and H. Kirk

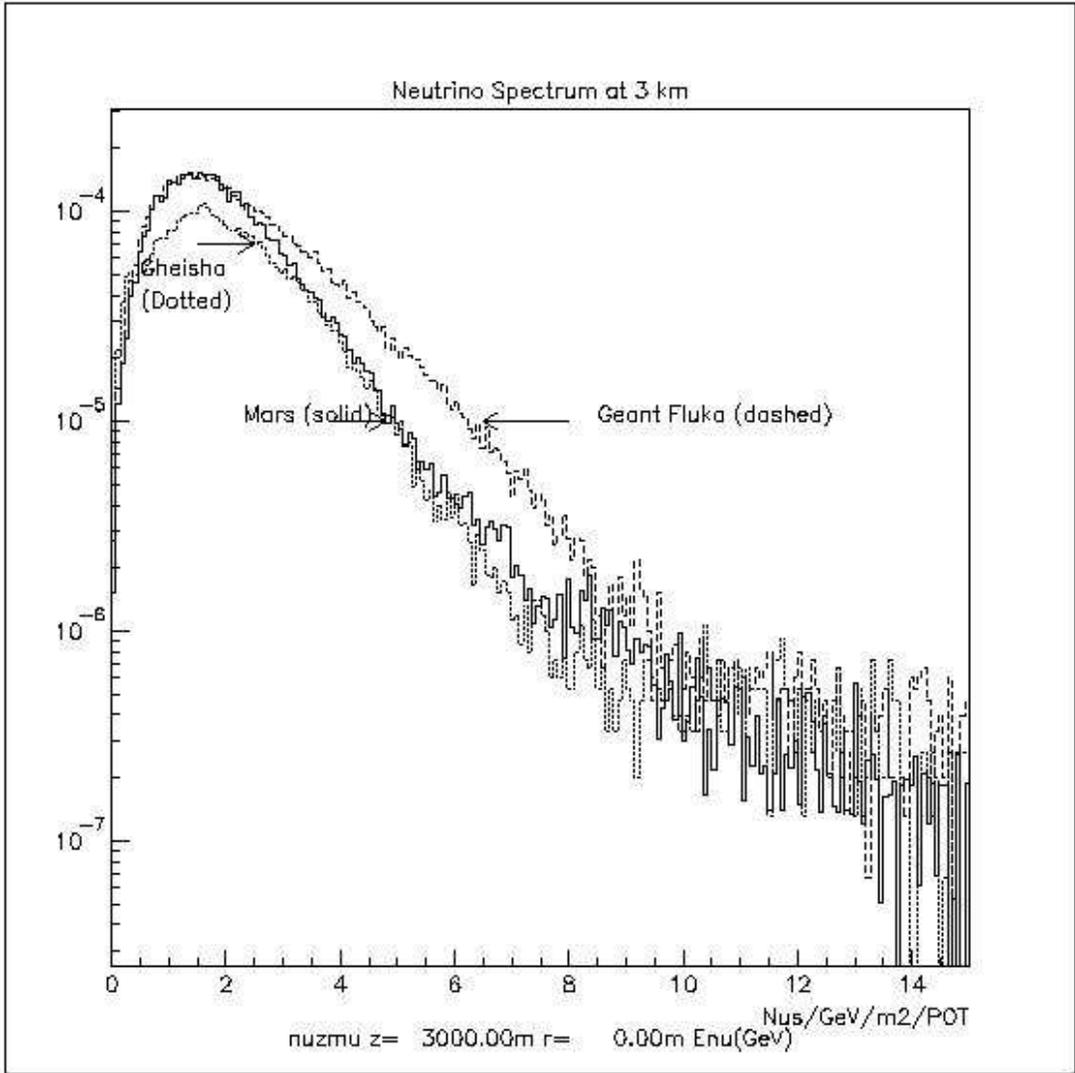
- We have been using the Geant/Fluka hadron shower package in Geant 3.2.1 for π^\pm and k^\pm production in the target. Our flux calculations are based on that.
- We have seen in the past that there are significant differences in the π^\pm production rates from the different programs that we have been using.
- In this exercise, we have generated a sample of π^\pm and k^\pm in MARS produced on a carbon target:
 - $R_{\text{target}} = 3.2 \text{ mm}$
 - $L_{\text{target}} = 60 \text{ cm}$
 - $\rho_{\text{target}} = 1.6 \text{ g/cm}^3$ for Carbon
- Mars events are output in *ICOOOL* format as they leave the target. *GUKINE* in Geant reads this in.
 - Mars events are weighted, (ie. *macro-particles*)
 - Geant is modified to carry this weight and apply at histogramming phase.
- Geant3 itself has two hadron shower packages:
 - G_Fluka, which we have used for our flux calculations.
 - The version that we use is circa 1990.
 - The Fluka people no longer support this version.
 - Gheisha. This is the standard package. It has been much maligned by critiques.
 - The CERN people no longer support this version. *It ain't object oriented.*

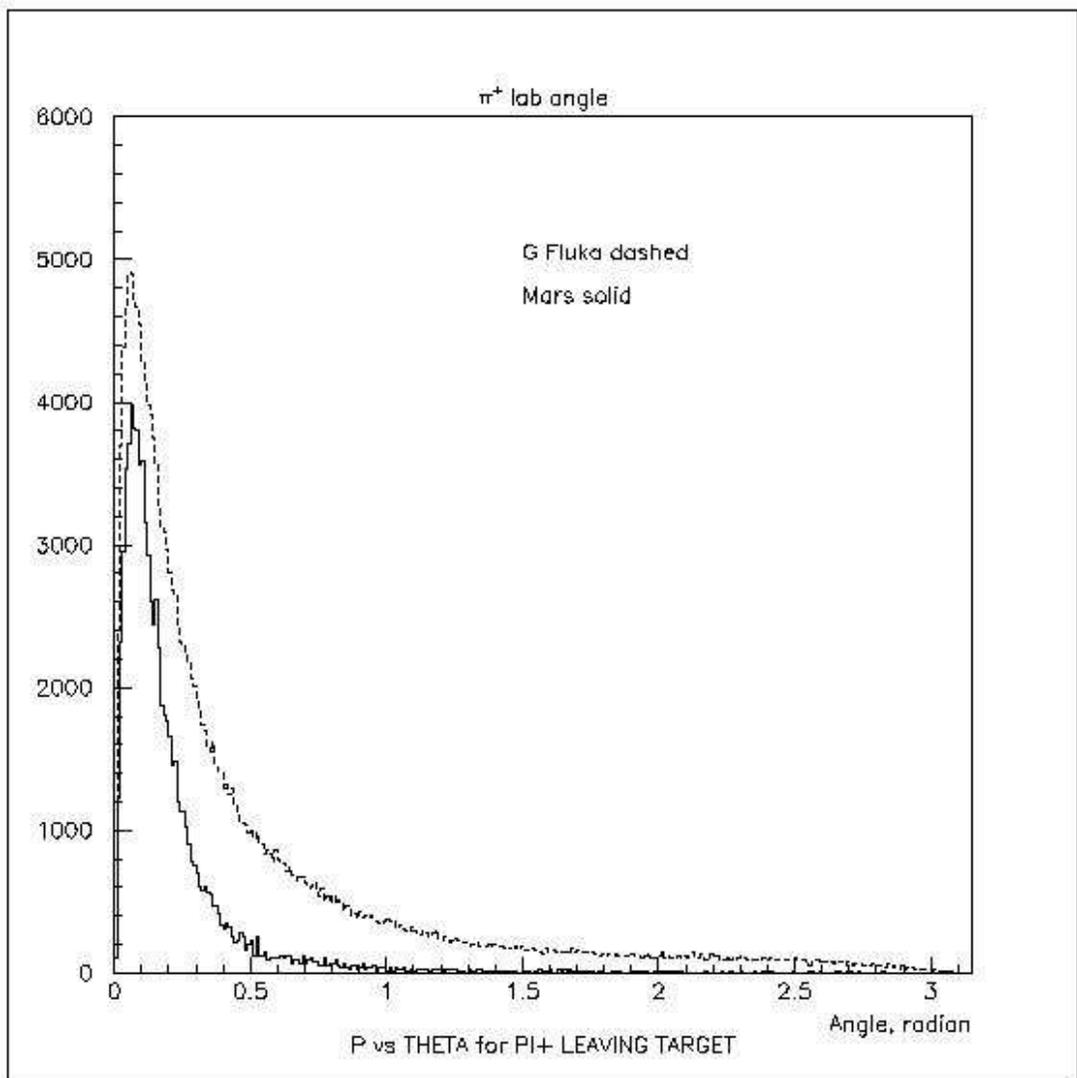


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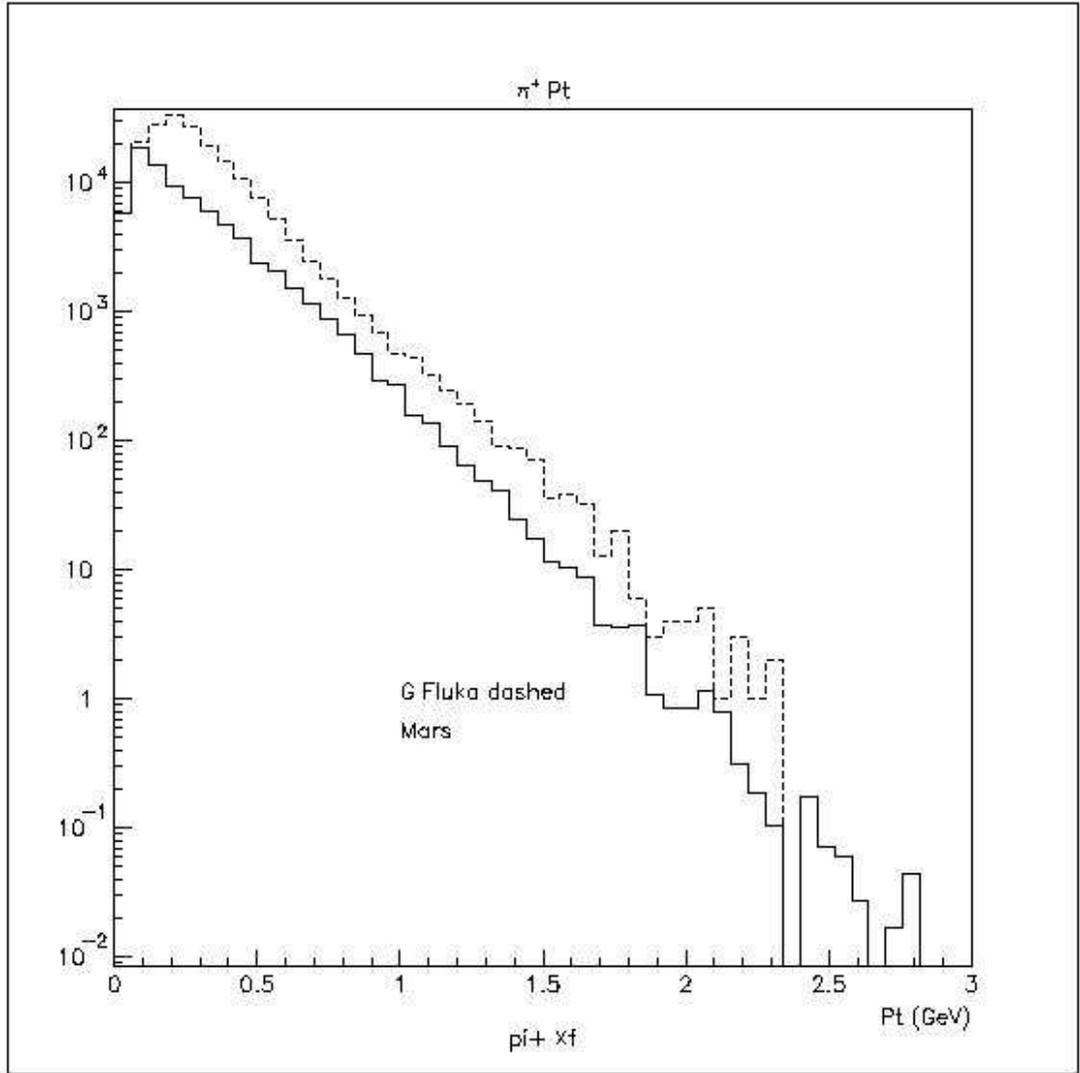


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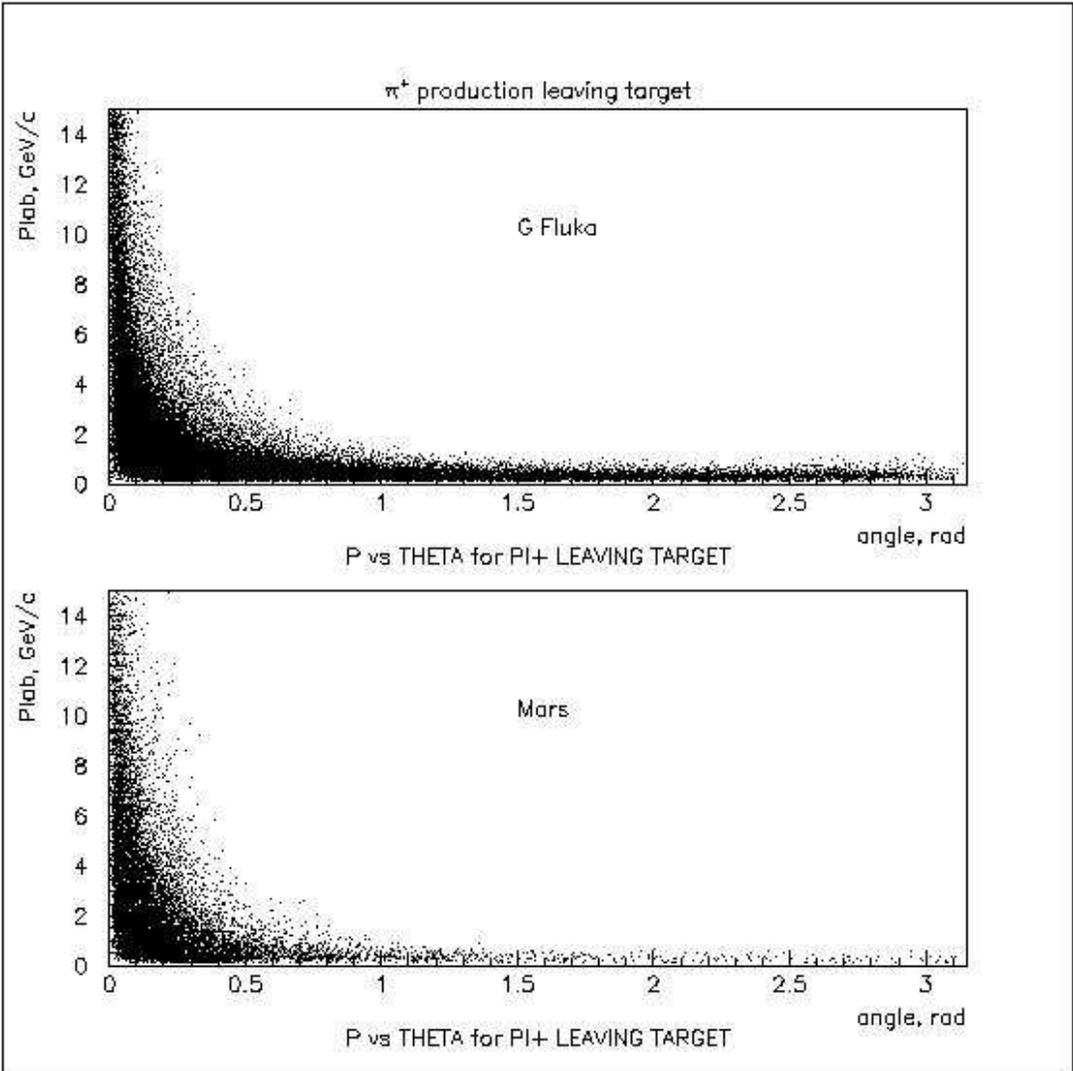




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- There are new versions of both Fluka and Gheisha available, but not integrated into the Geant3.
 - The new Gheisha is part of Geant4. It is said to be a new program.
- In the end this is an experimental question. There are/will be experimental data:
 - E910
 - Harp
 - MIPP
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