Update/Status of Geant4 Balloon Flight Simulator

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Cosmic-ray Proton

\[
J_{\text{primary}} = J_{\text{intrinsic}} \quad \text{AMS data} \quad (J \propto R^{2.79})
\]

*modulation* \quad *geomagnetic cutoff*

\[
\phi = 1100 \text{ MV}
\]

\[
\theta_M = 0.73
\]

**Polar angle distribution:**

Secondary (Tylka report):

\[
J(\theta) \propto 1 + 0.6 \sin \theta
\]

Primary: isotropic

Azimuth angle distribution: uniform distribution
Cosmic-ray electron

\[ J_{\text{primary}} = J_{\text{intrinsic}} \] (Komori 1999)

*modulation
*geomagnetic_cutoff

Angular distribution:
assume to be the same as proton

\[ J_{\text{secondary}} \] (Verma et al. 1967)
What we need to do…

• implement the newest proton/electron model in the simulator
• construct/implement positron/He flux
• construct/implement photon flux
• azimuth angle dependence of geomagnetic cutoff (east-west effect)