Physics 416 Quiz Sheet
Quiz 15
Name: _____

Correct the following paragraph according to the AIP Style Guide. Pay particular attention to the use of commas. Note where commas are used correctly as well.

(from T. AALTONEN et al. PHYSICAL REVIEW D 81, 031102, 2010. Mistakes added for this exercise ☺)

Model's in numerous, well-motivated theoretical frameworks make predictions for new phenomena at hadron colliders such as the Tevatron, and the Large Hadron Collider (LHC) [1,2]. Within each framework, one can construct 10s of qualitatively different models consistent with data. Thus when discoveries are made at a hadron collider, I face the inverse problem of how one maps back to the underlying theory that is: responsible for the new phenomena, and, congruent with all the other experimental results. A potentially powerful observable to discriminate among models and to extract the mass of new particles is the mT2 variable [4,5]. The mT2 variable a critical product of the experiment is based on transverse mass in events with two missing particles. A simple approximation for the mT2 relation is

$$mT2 = \frac{\frac{3J}{J+1} T_N m^2}{E_n - B_n^2 b^2 n^2 T_n} \qquad (1)$$

where the variables are defined in the previous section. The above mT2 approximation is valid if the values of the E_ns are between 10,000 and 140,000 GeV. At lower energies however it can be used if an error approaching 5.% is acceptable: at these energies the deviation from a Gaussian distribution is small (see Fig. 1). Such values are realized when the proton velocity is less than 200 000 meters/s.