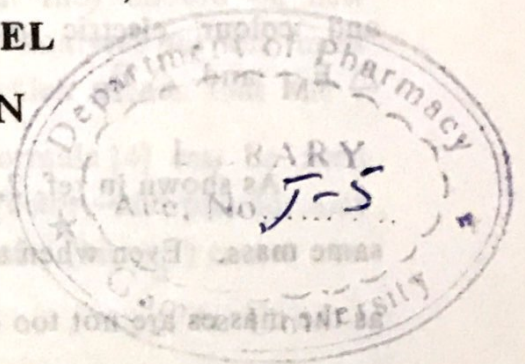# MASSES OF MESONS WITH (HIDDEN) BEAUTY IN THE BAG MODEL

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ABSTRACT

The MIT Bag model is used to predict the masses of the radial (and orbital) excitations of the heavy meson at 9.41 Gev (the γ—family) and it is found that the situation in the beauty sector is somewhat similar to the charm sector, where the static sphere bag model can not sustain excitation energies of more than 350 Mev.

1. INTRODUCTION

The MIT bag model was first successfully applied to the masses of light hadrons by chodes et. al. [1] and De Grand et. al [2]. The formula which they used for the masses of hadrons has now become widely accepted and is taken as a prescription. The formula consists of the followiug terms :

(a) Volume energy term $E_V = \frac{3}{4} \pi B R^3$ and the zero point energy $E_0 = \frac{-Z_0}{R}$, both of which depends only on the radius R of the hadron and are assumed to originate from the quantum fluctuations of the system. As discussed in ref. 2, the theoretical significance of the second term is somewhat unclear and is treated only phenomenologically.

(b) Each quark contributes its rest and kinetic energy to the hadron mass. This energy contribution is denoted by E_Q and given by

$$E_Q = \sum_{m_i} N_{m_i} /R [x^2 + (m_i R)^2]^{\frac{1}{2}}$$

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