Abstract Submitted
for the APR12 Meeting of
The American Physical Society

Applications of Two-Body Dirac Equations to the Meson Spectrum with Three Versus Two Covariant Interactions, SU(3) Mixing
JAMES SCHIERMEYER, HORACE CRATER, The University of Tennessee Space Institute — In a previous work Crater and Van Alstine applied the Two Body Dirac equations of constraint dynamics to quark-antiquark bound states using a relativistic extention of the Adler-Piran potential in which the transformation properties of the quark-antiquark potentials were limited to a scalar and an electromagnetic-like four vector, with the former accounting for the confining aspects of the overall potential, and the latter the short range portion. The static Adler-Piran potential was first given an invariant form and then apportioned between those two different types of potentials. Here we make a change in this apportionment that leads to a substantial improvement in the resultant spectroscopy by including a time-like confining vector potential over and above the scalar confining one and the electromagnetic-like vector potential. Our fit includes 19 more mesons than the earlier results and we modify the scalar portion of the potential in such a way that allows this formalism to account for the isoscalar mesons η and η' not included in the previous work.

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Date submitted: 03 Jan 2012 Electronic form version 1.4