Abstract Submitted
for the APR12 Meeting of
The American Physical Society

A Gaussian Sum-Rules Analysis of Scalar Meson-Glueball Mixing[1] DEREK HARNETT, University of the Fraser Valley, TOM STEELE, ROBIN KLEIV, University of Saskatchewan, KEN MOATS, Carleton University — Gaussian QCD sum-rules (GSRs) are well-suited to a study of meson-glueball mixing due to their balanced sensitivity to ground and excited states. The GSRs corresponding to both diagonal and non-diagonal (crossed) two-point correlators between scalar-isoscalar (non-strange) quark currents and gluonic currents will be presented. For the crossed correlator, we show that perturbative and gluon condensate contributions are chirally-suppressed as compared to non-perturbative effects of the quark condensate, mixed condensate, and instantons, implying that the mixing of quark mesons and gluonium is of a non-perturbative origin. Independent predictions of the masses and relative coupling strengths stemming from the three GSRs (two diagonal and one non-diagonal) are remarkably consistent with a scenario of two states with masses of approximately 1 GeV and 1.4 GeV that couple to significant mixtures of quark and gluonic currents. The mixing is nearly maximal with the heavier mixed state having a slightly larger gluonium content than the lighter state.

[1]This work was supported through NSERC Discovery Grants.

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Date submitted: 06 Jan 2012 Electronic form version 1.4