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Hybrid Meson Mixing in the $Y(2175)$[1] JASON HO, RYAN BERG, TOM STEELE, Univ of Saskatchewan, DEREK HARNETT, University of the Fraser Valley, WEI CHEN, Sun Yat-Sen University — The nature of the $Y(2175)$ (also known as the $\phi(2170)$) has remained elusive since it was observed at BaBar in 2006 and later confirmed independently by BES and Belle. Proposed interpretations of the state have included an excited $3\,^3S_1$ and $2\,^3D_1$ strangeonium state, molecular $\bar{\Lambda}\Lambda$ state, and $ss\bar{s}\bar{s}$ four-quark state. Additionally, the $Y(2175)$ has also been considered as an $\bar{s}Gs$ hybrid meson state; lattice results point to an expected vector strangeonium-like hybrid between $2.4 - 2.5\,\text{GeV}$ at a reported $m_\pi = 396\,\text{MeV}$. We consider whether a hybrid meson interpretation of the $Y(2175)$ is consistent within the framework of QCD sum rules. Using Gaussian sum rules, we use phenomenological inputs from measurements of the $Y(2175)$ to analyse correlation functions of composite operators corresponding to the $J^{PC} = 1^{--}$ strangeonium-like hybrid meson state, extending the calculation from previous sum rule results. We find that the optimized sum rule predicts no significant hybrid content in the $Y(2175)$ state.

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