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Relating the strangeness content of the nucleon with the mass shift of the phi meson in nuclear matter

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The behavior of the ϕ meson at finite density is studied, making use of a QCD sum rule approach in combination with the maximum entropy method. It is demonstrated that a
possible mass shift of the ϕ in nuclear matter is strongly correlated to the strangeness content of the nucleon, which is proportional to the strange sigma term, σ_{sN}. In contrast to earlier studies, our results show that, depending on the value of σ_{sN}, the ϕ meson could receive both a positive or negative mass shift at nuclear matter density. We find that these results depend only weakly on potential modifications of the width of the σ_{sN} meson peak and on assumptions
made on the behavior of four-quark condensates at finite density.

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