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Analysis of the scalar and vector channels in many flavor QCD

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In the search for a composite Higgs boson in walking technicolor models, many flavor QCD is an attractive candidate. Particularly promising is the $N_f=8$ theory, which has been found to have a composite flavor-singlet scalar as light as the pion. Based on simulations of this theory with the HISQ action at various fermion masses in the LatKMI collaboration, we will present our preliminary results on the scalar decay constant using the fermionic bilinear operator. We will then discuss a possible relation between the scalar decay constant and the decay constant of the techni-dilaton, which would be identified with a composite Higgs boson. The (axial) vector current is used to compute the S -parameter and the vector meson decay constant. Chiral behavior of these low-energy quantities will be also discussed.

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