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Femtoscopy for D*0(2300) and D*s0(2317) states

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We predict the correlation functions relevant in femtoscopy studies for S-wave $D_{(s)}\phi$ pairs, with $D_{(s)}$ a pseudoscalar open charm meson and ϕ a Goldstone boson, describing their interactions with next-to-leading order unitarized heavy-meson chiral perturbation theory amplitudes.

In the $(S, I) = (0, 1/2)$ sector, the effect of the two-state structure around 2300 MeV can be clearly seen in the correlation functions of the $D\pi$, $D\eta$, $D_s\overline{K}$ channels. In the $(1, 0)$ sector, a depletion of the correlation function near the DK threshold can be seen, produced by the $D_{s0}^*(2317)^{\pm}$ state lying below the DK threshold.

These correlation functions could be experimentally measured, and will shed light into the hadron spectrum and, in particular, into the nature of these states.

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