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The state-of-the-art covariant tetraquark equations

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We present exact yet practical covariant equations of quantum field theory describing a tetraquark in terms of a mix of four-quark and two-quark states. A feature of our approach is that it avoids the overcounting problems that usually plague quantum field theory formulations of few-body covariant equations (the only exception being the two-body Bethe-Salpeter equation).
Although the model chosen in the current work describes the four-quark dynamics in terms of meson-meson and diquark-antidiquark states, the derived equations have a form that is exact, as all corrections due to the use of a particular model are taken into account through the use of a well-defined special four-point amplitude Δ entering the equations. The equations are in agreement with those obtained previously by consideration of disconnected interactions [Phys.Rev.D 90 (2014) 4, 045042]; however, despite being more general, they have been derived here in a much simpler and more transparent way.
As an example of the universality of our formulation we show, that it is able to unify seemingly unrelated models of the tetraquark, like, for example, the model of the Moscow group [Universe 7, 94 (2021)] and the coupled channel
model of the Giessen group [Phys. Lett. B 718, 545 (2012)].

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1. Phys.Rev.D 107 (2023) 9, 094014,
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