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Erratum

Erratum to: "Vertex functions and infrared fixed point in Landau gauge SU(N) Yang–Mills theory" [Phys. Lett. B 611 (2005) 279]

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When displaying the leading infrared power-law behavior of a given Green's function, it behooves one to show that the corresponding pre-coefficient, a constant, does not vanish, else a subleading power might dominate and invalidate the scaling analysis. In our analytic evaluation of the relevant constants in Eqs. (8)–(11) we have made an approximation that turned out not to be appropriate. The coefficients displayed in Eqs. (8)–(11) are therefore not correct. Here we offer a numerical evaluation of these coefficients which demonstrates that *the coefficients are not vanishing and our power laws, as all other results of the Letter other than these three constants, remain valid.* We have checked our numerical results against a (quite involved) analytical analysis in terms of Appell functions [1] and find nice agreement. Our results are displayed in Fig. 1.

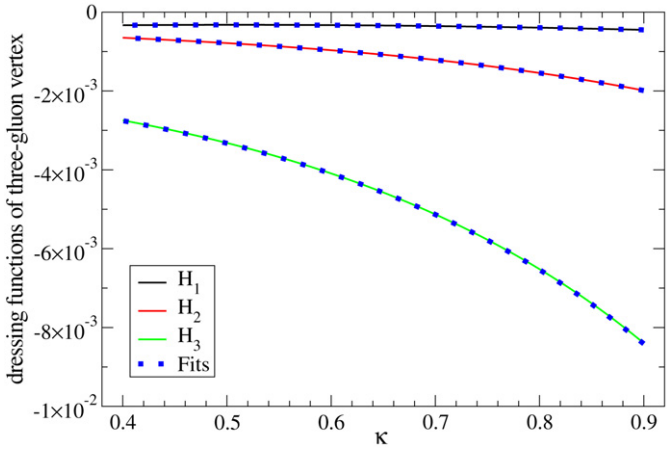

Fig. 1. Dependence of the constants multiplying the dressings H_1, H_2 and H_3 of the three-gluon vertex at the symmetric point $p_1^2 = p_2^2 = p_3^2 \equiv p^2$ as a function of the infrared exponent κ of its power law $(p^2)^{-3\kappa}$.

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Eqs. (8)–(11) of the original paper are henceforth retracted, and we substitute them by the following numerical fits, also seen in the figure for the range of largest interest $\kappa \in [0.4, 0.9]$. The fits are performed in the range of $]0, 1[$, which explains the presence of the $1/\kappa$-term in the fit for H_1; this function is indeed diverging in the limit $\kappa \to 0$.

We obtain

$$H_1^{3g}(p^2) = hH_1(\kappa)(p^2)^{-3\kappa} = h10^{-4}\big(-0.88/\kappa + 0.25 - 4.60\big(\kappa - \kappa^2 + \kappa^3\big)\big)(p^2)^{-3\kappa}, \tag{8}$$

$$H_2^{3g}(p^2) = hH_2(\kappa)(p^2)^{-3\kappa} = h10^{-4}\big(-4.37 + 1.75\kappa - 23.2\big(\kappa^2 - \kappa^3 + \kappa^4\big)\big)(p^2)^{-3\kappa}, \tag{9}$$

$$H_3^{3g}(p^2) = hH_3(\kappa)(p^2)^{-3\kappa} = h10^{-4}\big(-18.5 + 7.1\kappa - 97.7\big(\kappa^2 - \kappa^3 + \kappa^4\big)\big)(p^2)^{-3\kappa}, \tag{10}$$

with

$$h = g^2 N_c B^3, \tag{11}$$

all notations being consistent with the original Letter. We sincerely apologize to anybody who might have been confused by this small error. As mentioned above, all other results of the Letter other than these three constants remain valid.

References

[1] M.Q. Huber, Infrared Behavior of Vertex Functions in d-Dimensional Yang–Mills Theory, Diploma Thesis, Supervisor: R. Alkofer, University of Graz, Austria, 2007, http://physik.uni-graz.at/itp/publications_students.php.