Errata

Erratum: Gauge fields on a lattice. III. Strong-coupling expansions and transition points [Phys. Rev. D 11, 2104 (1975)]

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We apologize for some erroneous coefficients in formulas (4.17), (4.18), and (4.19). We display here the correct free energy for the groups Z_2, U(1), and SU(2) and give also the corresponding results for Z_3 and SU(3) gauge groups.

For Z_2,

$$\frac{F}{d(d-1)} = \tfrac{1}{4}\beta^2 - \tfrac{1}{24}\beta^4 + (\tfrac{1}{6}d - \tfrac{29}{90})\beta^6 + (-\tfrac{1}{3}d + \tfrac{3343}{5040})\beta^8$$
$$+ (d^2 - \tfrac{184}{45}d + \tfrac{118\,471}{28\,350})\beta^{10} + (-\tfrac{8}{3}d^2 + \tfrac{121\,153}{11\,340}d - \tfrac{20\,022\,781}{1\,871\,100})\beta^{12}$$
$$+ (10\,d^3 - \tfrac{208}{3}d^2 + \tfrac{935\,561}{5\,670}d - \tfrac{5\,647\,451\,354}{42\,567\,525})\beta^{14}$$
$$+ (-26\,d^3 + \tfrac{129\,161}{840}d^2 - \tfrac{376\,639\,121}{1\,247\,400}d + \tfrac{4\,021\,634\,721\,191}{20\,432\,412\,000})\beta^{16} + O(\beta^{18}) .$$

For Z_3,

$$\frac{F}{d(d-1)} = \tfrac{1}{8}\beta^2 + \tfrac{1}{48}\beta^3 - \tfrac{1}{128}\beta^4 - \tfrac{1}{256}\beta^5 + (\tfrac{1}{192}d - \tfrac{51}{5120})\beta^6 + (\tfrac{1}{128}d - \tfrac{153}{10\,240})\beta^7$$
$$+ (\tfrac{1}{1024}d - \tfrac{2\,187}{1\,146\,880})\beta^8 + (-\tfrac{35}{6\,144}d + \tfrac{46\,597}{4\,128\,768})\beta^9$$
$$+ (\tfrac{1}{512}d^2 - \tfrac{1\,017}{81\,920}d + \tfrac{779\,381}{45\,875\,200})\beta^{10} + (\tfrac{3}{512}d^2 - \tfrac{4\,047}{163\,840}d + \tfrac{2\,383\,531}{91\,750\,400})\beta^{11}$$
$$+ (\tfrac{137}{24\,576}d^2 - \tfrac{52\,709}{2\,293\,760}d + \tfrac{191\,096\,159}{8\,074\,035\,200})\beta^{12}$$
$$+ (-\tfrac{15}{8\,192}d^2 + \tfrac{57}{8\,192}d - \tfrac{3\,041\,827}{461\,373\,440})\beta^{13}$$
$$+ (\tfrac{5}{4\,096}d^3 - \tfrac{533}{32\,768}d^2 + \tfrac{3\,826\,173}{73\,400\,320}d - \tfrac{287\,774\,341\,033}{5\,877\,897\,625\,600})\beta^{14}$$
$$+ (\tfrac{17}{3\,072}d^3 - \tfrac{7\,027}{163\,840}d^2 + \tfrac{34\,256\,119}{314\,572\,800}d - \tfrac{15\,959\,874\,120\,733}{176\,336\,928\,768\,000})\beta^{15}$$
$$+ (\tfrac{603}{65\,536}d^3 - \tfrac{4\,553\,361}{73\,400\,320}d^2 + \tfrac{18\,321\,594\,271}{129\,184\,563\,200}d - \tfrac{205\,245\,882\,159\,867}{1\,880\,927\,240\,192\,000})\beta^{16} + O(\beta^{17}) .$$

For U(1),

$$\frac{F}{d(d-1)} = \tfrac{1}{8}\beta^2 - \tfrac{1}{128}\beta^4 + (\tfrac{1}{192}d - \tfrac{11}{1\,152})\beta^6 + (-\tfrac{1}{256}d + \tfrac{757}{98\,304})\beta^8$$
$$+ (\tfrac{1}{512}d^2 - \tfrac{85}{12\,288}d + \tfrac{2\,473}{409\,600})\beta^{10} + (-\tfrac{29}{12\,288}d^2 + \tfrac{2\,467}{262\,144}d - \tfrac{1\,992\,533}{212\,336\,640})\beta^{12}$$
$$+ (\tfrac{5}{4\,096}d^3 - \tfrac{237}{32\,768}d^2 + \tfrac{178\,003}{11\,796\,480}d - \tfrac{38\,197\,099}{3\,468\,165\,120})\beta^{14}$$
$$+ (-\tfrac{15}{8192}d^3 + \tfrac{1\,485}{131\,072}d^2 - \tfrac{53\,956\,913}{2\,264\,924\,160}d + \tfrac{11\,483\,169\,709}{676\,457\,349\,120})\beta^{16} + O(\beta^{18}) .$$

For SU(2),

$$\frac{F}{d(d-1)} = \tfrac{1}{4}\beta^2 - \tfrac{1}{48}\beta^4 + (\tfrac{1}{96}d - \tfrac{5}{288})\beta^6 + (-\tfrac{1}{96}d + \tfrac{29}{1\,440})\beta^8$$
$$+ (\tfrac{1}{256}d^2 - \tfrac{49}{4608}d + \tfrac{1\,001}{172\,800})\beta^{10} + (-\tfrac{7}{1024}d^2 + \tfrac{32\,131}{1\,244\,160}d - \tfrac{211\,991}{8\,709\,120})\beta^{12}$$
$$+ (\tfrac{5}{2048}d^3 - \tfrac{43}{4096}d^2 + \tfrac{5\,341}{368\,640}d - \tfrac{264\,497}{40\,642\,560})\beta^{14}$$
$$+ (-\tfrac{47}{8192}d^3 + \tfrac{7\,030\,933}{212\,336\,640}d^2 - \tfrac{97\,100\,911}{1\,486\,356\,480}d + \tfrac{1\,474\,972\,157}{33\,443\,020\,800})\beta^{16} + O(\beta^{18}) .$$

For SU(3),

$$\frac{F}{d(d-1)}=\tfrac{1}{2}\beta^2+\tfrac{1}{6}\beta^3-\tfrac{1}{24}\beta^5+(\tfrac{1}{243}d-\tfrac{113}{3\,888})\beta^6+(\tfrac{1}{81}d-\tfrac{133}{6\,480})\beta^7+(\tfrac{5}{324}d-\tfrac{1\,069}{51\,840})\beta^8$$
$$+(\tfrac{5}{972}d-\tfrac{509}{77\,760})\beta^9+(\tfrac{2}{6561}d^2-\tfrac{157}{11\,664}d+\tfrac{490\,757}{20\,995\,200})\beta^{10}+(\tfrac{4}{2\,187}d^2-\tfrac{59}{2160}d+\tfrac{435\,299}{9\,797\,760})\beta^{11}$$
$$+(\tfrac{1\,775}{354\,294}d^2-\tfrac{218\,824\,907}{7\,255\,941\,120}d+\tfrac{1\,682\,010\,779}{42\,326\,323\,200})\beta^{12}$$
$$+(\tfrac{440}{59\,049}d^2-\tfrac{13\,919\,677}{604\,661\,760}d+\tfrac{7\,603\,159}{440\,899\,200})\beta^{13}$$
$$+(\tfrac{20}{531\,441}d^3+\tfrac{8\,377}{2\,125\,764}d^2-\tfrac{12\,469\,727}{5\,441\,955\,840}d-\tfrac{14\,239\,256\,399}{1\,333\,279\,180\,800})\beta^{14}$$
$$+(\tfrac{544}{1\,594\,323}d^3-\tfrac{69\,331}{7\,971\,615}d^2+\tfrac{106\,962\,409}{2\,821\,754\,880}d-\tfrac{3\,474\,317\,893}{79\,361\,856\,000})\beta^{15}$$
$$+(\tfrac{2\,323}{1\,594\,323}d^3-\tfrac{5\,838\,272\,899}{220\,399\,211\,520}d^2+\tfrac{10\,597\,782\,658\,021}{123\,423\,558\,451\,200}d-\tfrac{6\,402\,970\,751\,747}{82\,282\,372\,300\,800})\beta^{16}$$
$$+O(\beta^{17})\,.$$

Erratum: Eigenvalue conditions and asymptotic freedom of SO(N) gauge theories [Phys. Rev. D 18, 4721 (1978)]

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Equation (8a) has misprints. It should read

$$Z_{\text{gauge boson}}=1+\frac{g^2}{16\pi^2}\left[\tfrac{26}{3}(N-2)-2\frac{n_F n_D}{3}-\tfrac{2}{3}(N-2)\right]\ln\Lambda\,.$$