

diagram 1

QCD=3, QED=2

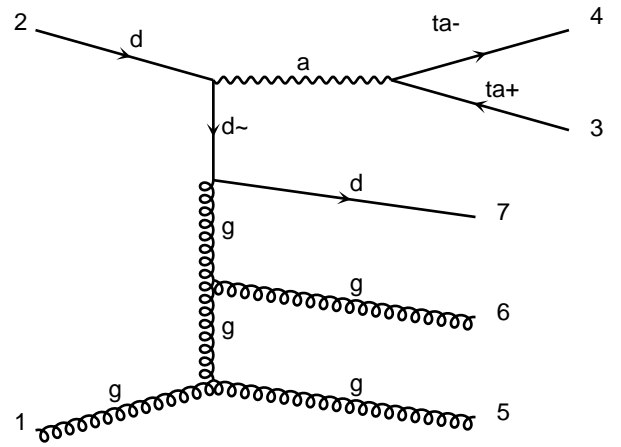


diagram 2

QCD=3, QED=2

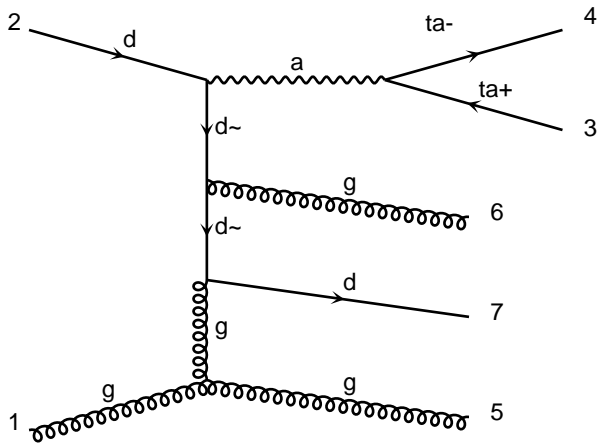


diagram 3

QCD=3, QED=2

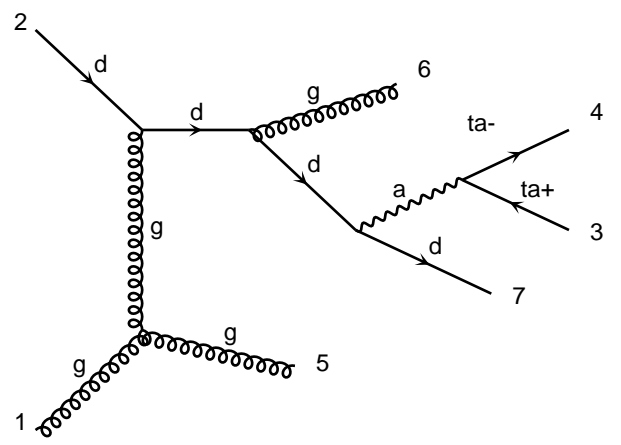


diagram 4

QCD=3, QED=2

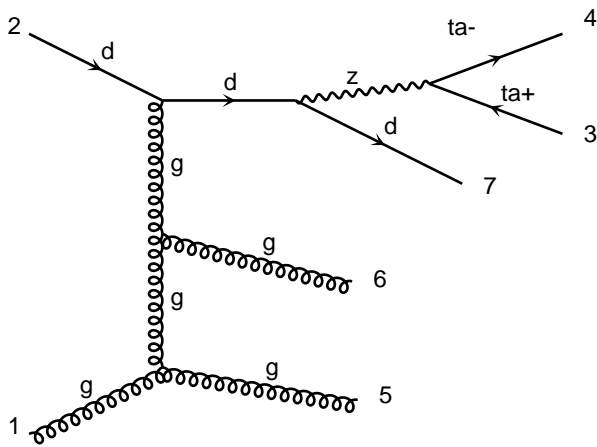


diagram 5

QCD=3, QED=2

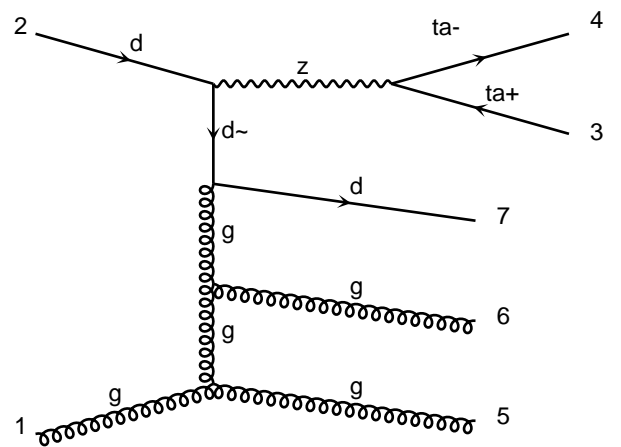


diagram 6

QCD=3, QED=2

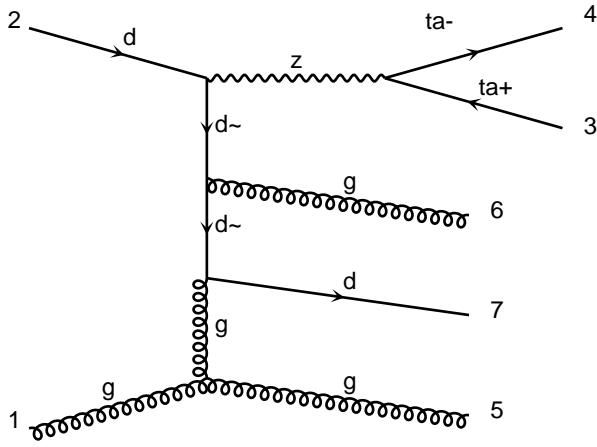


diagram 7 QCD=3, QED=2

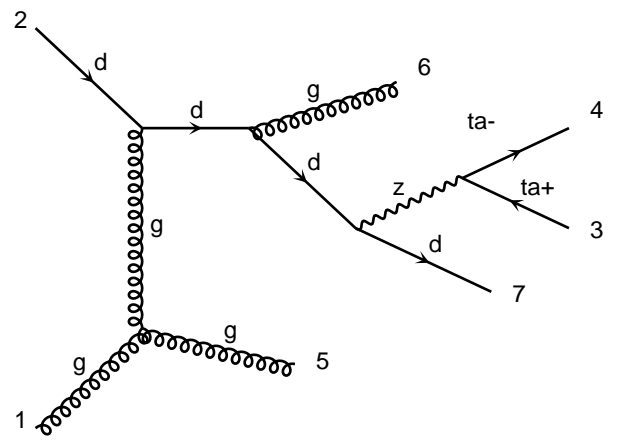


diagram 8 QCD=3, QED=2

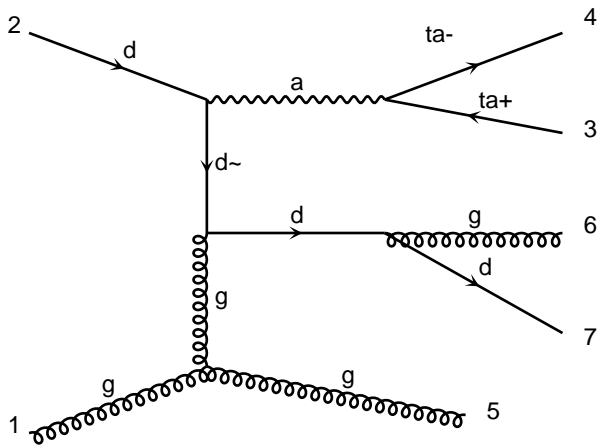


diagram 9 QCD=3, QED=2

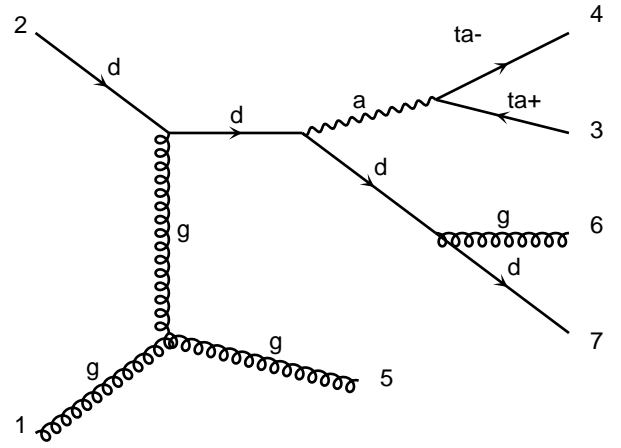


diagram 10 QCD=3, QED=2

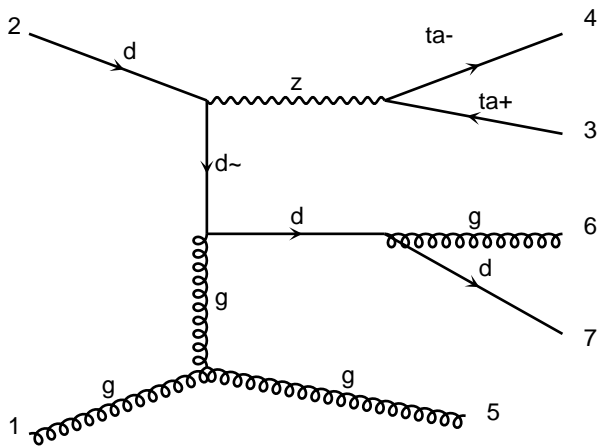


diagram 11 QCD=3, QED=2

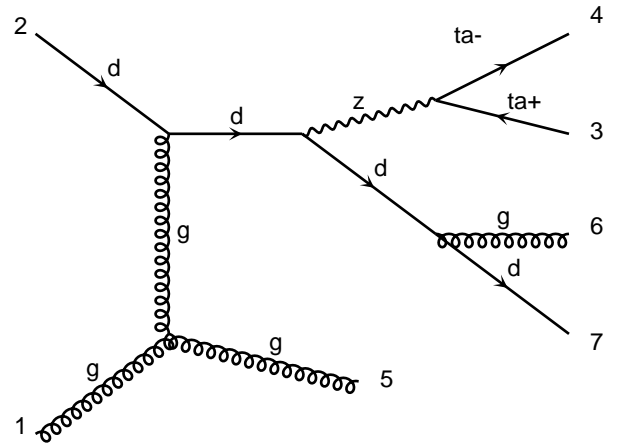


diagram 12 QCD=3, QED=2

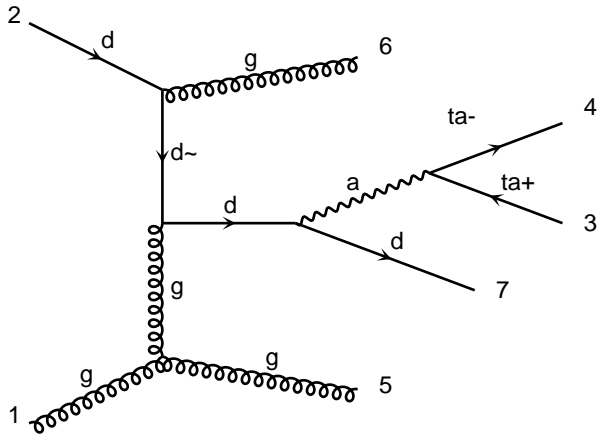


diagram 13 QCD=3, QED=2

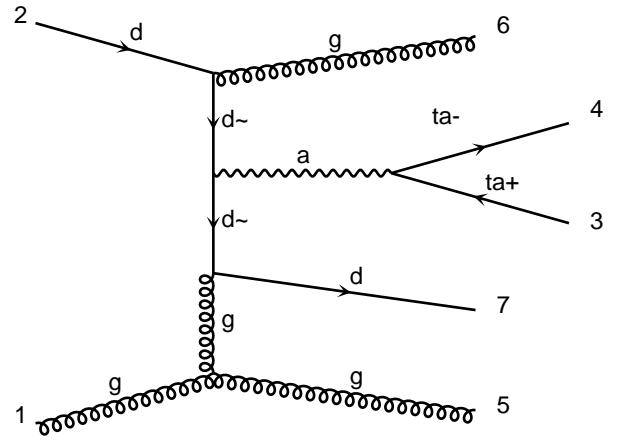


diagram 14 QCD=3, QED=2

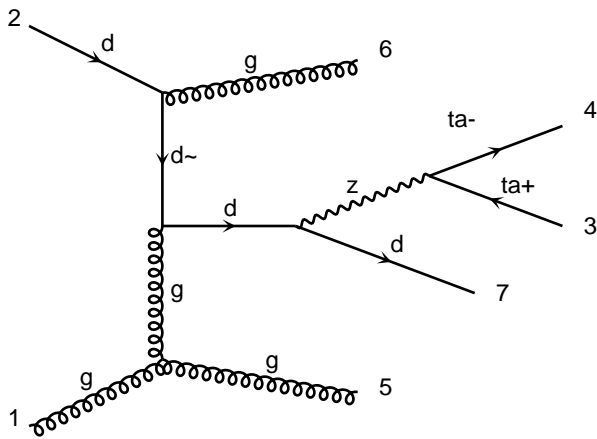


diagram 15 QCD=3, QED=2

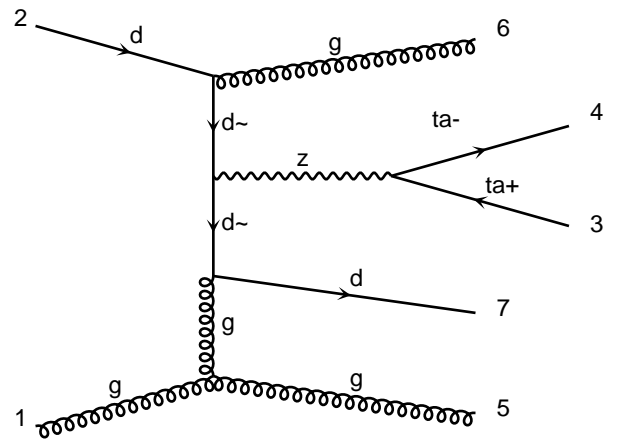


diagram 16 QCD=3, QED=2

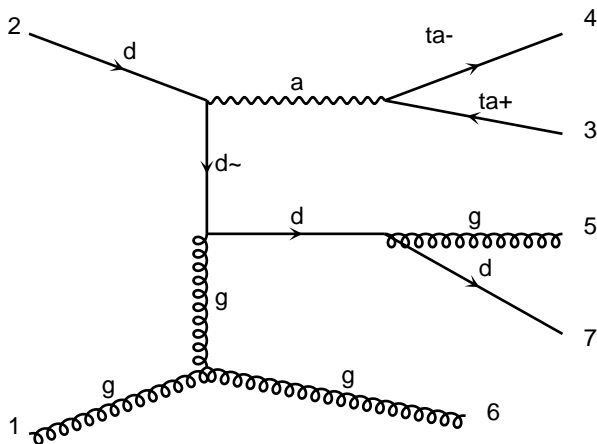


diagram 17 QCD=3, QED=2

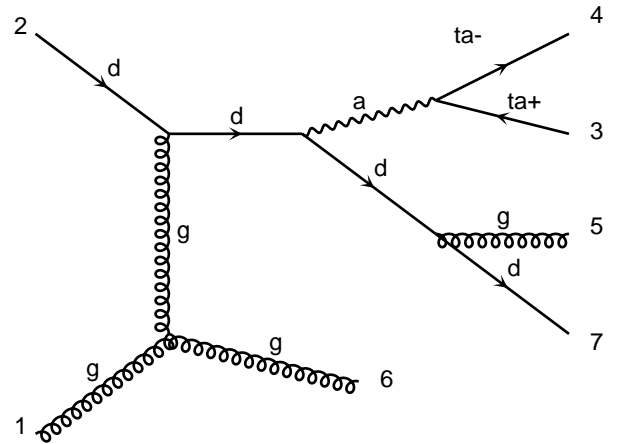


diagram 18 QCD=3, QED=2

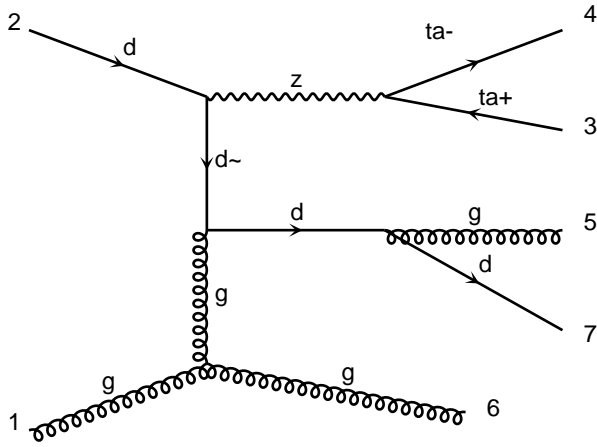


diagram 19 QCD=3, QED=2

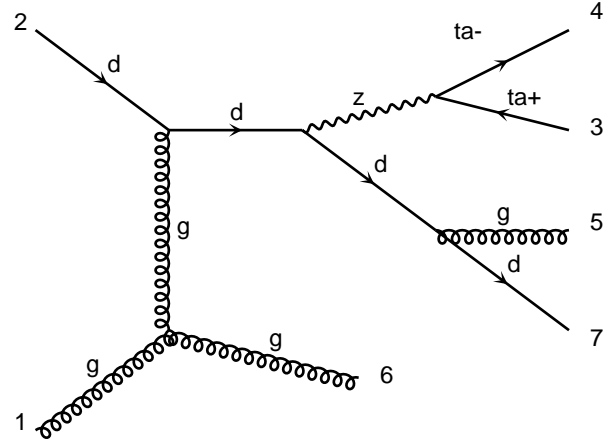


diagram 20 QCD=3, QED=2

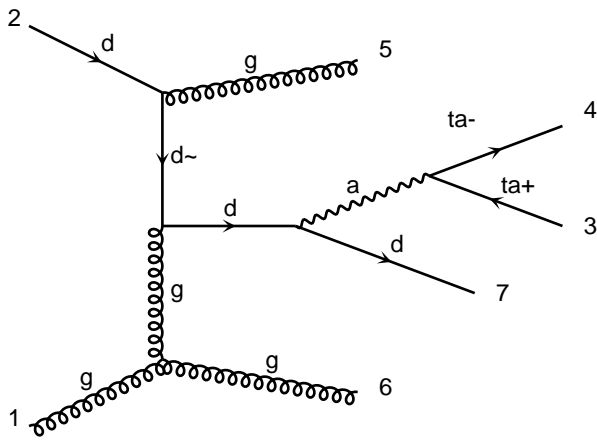


diagram 21 QCD=3, QED=2

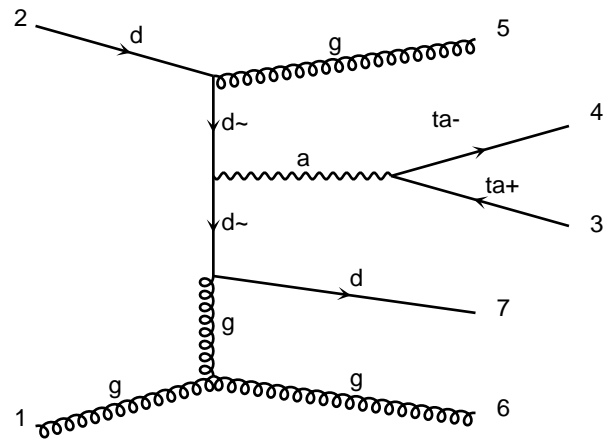


diagram 22 QCD=3, QED=2

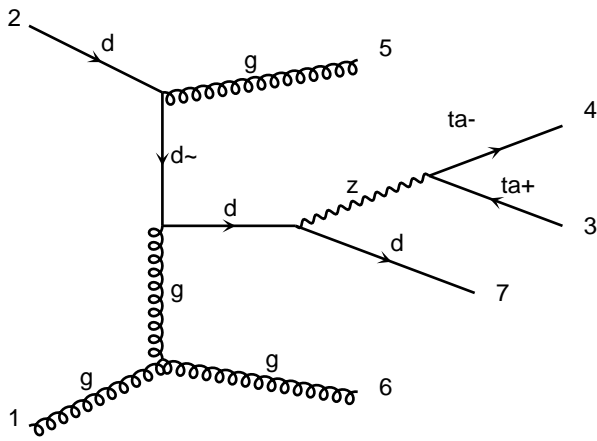


diagram 23 QCD=3, QED=2

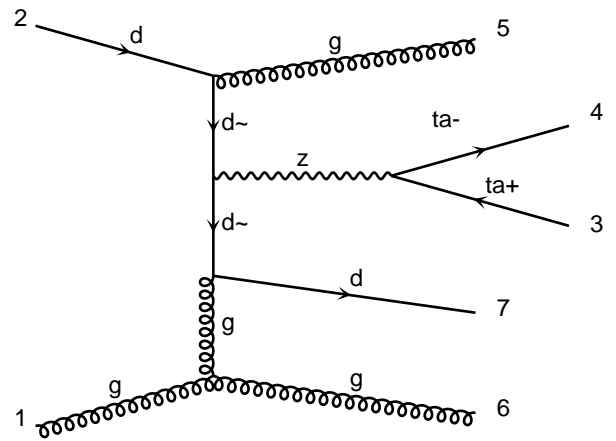


diagram 24 QCD=3, QED=2

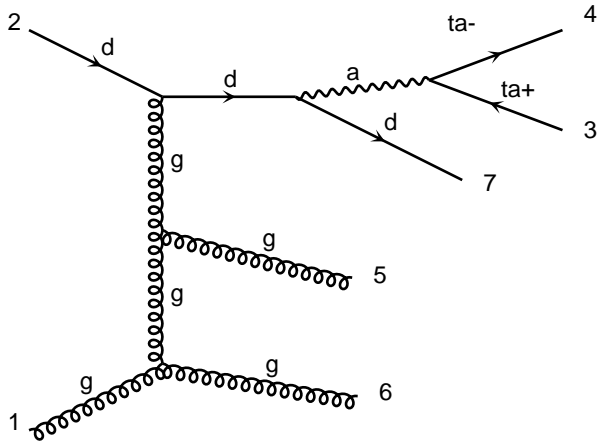


diagram 25 QCD=3, QED=2

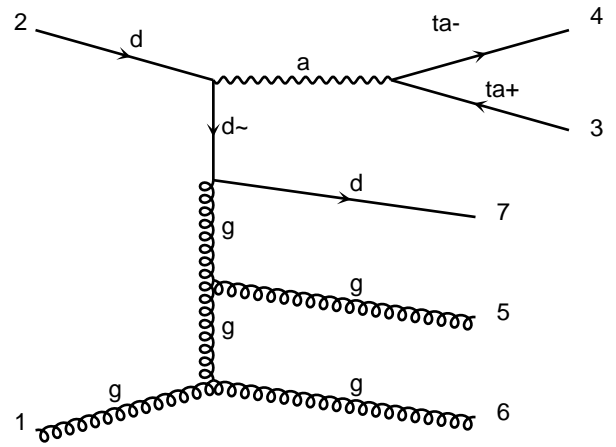


diagram 26 QCD=3, QED=2

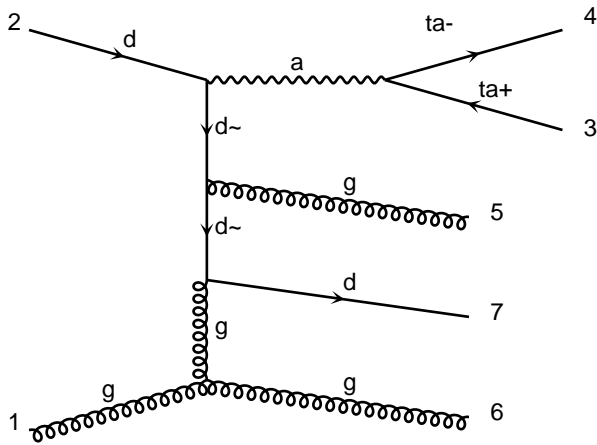


diagram 27 QCD=3, QED=2

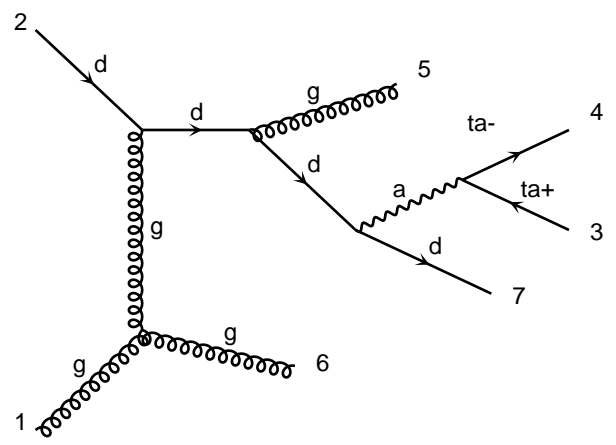


diagram 28 QCD=3, QED=2

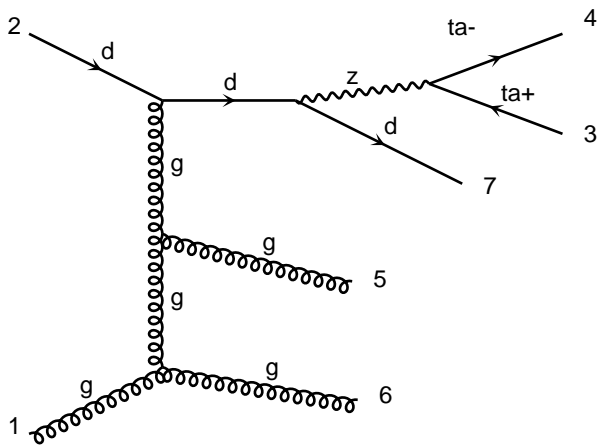


diagram 29 QCD=3, QED=2

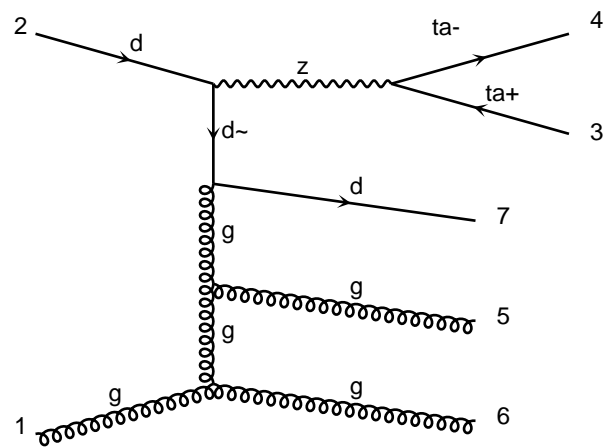


diagram 30 QCD=3, QED=2

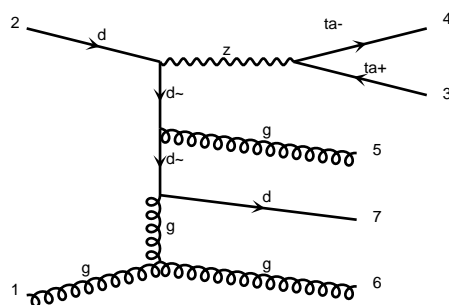


diagram 31                      QCD=3, QED=2

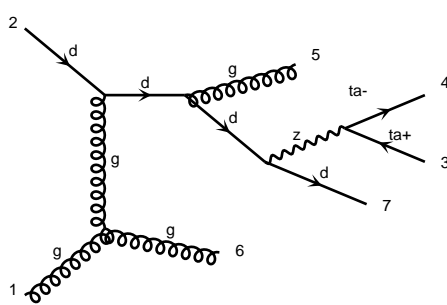


diagram 32                      QCD=3, QED=2

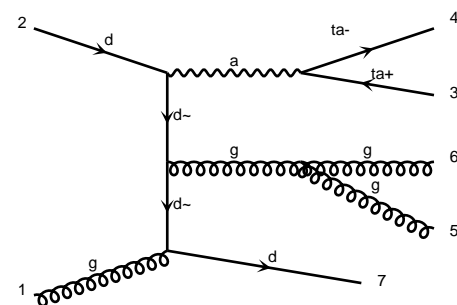


diagram 33      QCD=3, QED=2

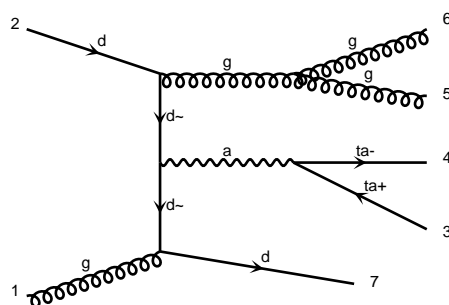


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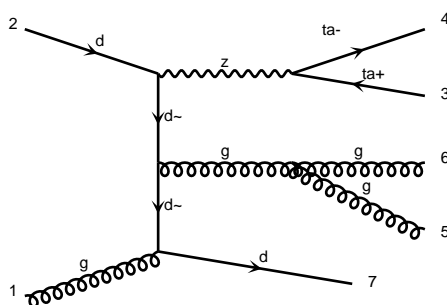


diagram 35                      QCD=3, QED=2

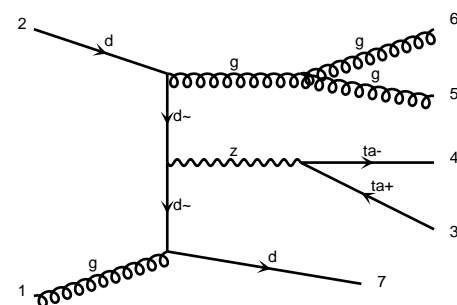


diagram 36      QCD=3, QED=2

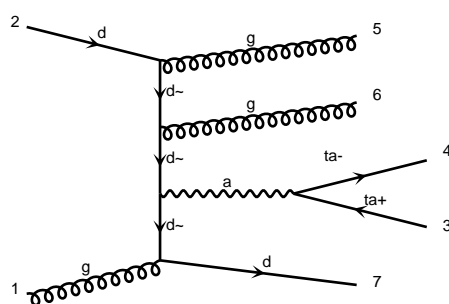


diagram 37                      QCD=3, QED=2

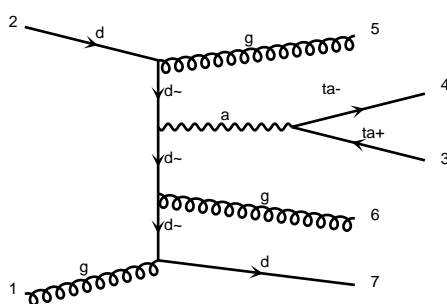


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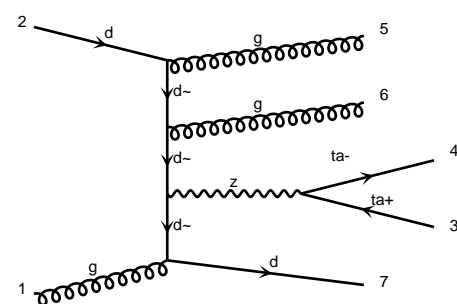


diagram 39      QCD=3, QED=2

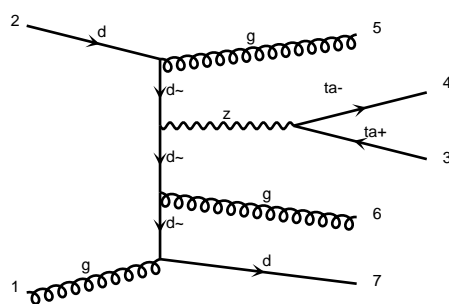


diagram 40                      QCD=3, QED=2

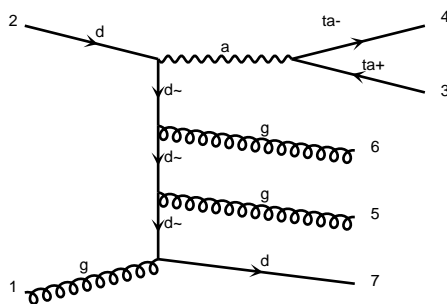


diagram 41                      QCD=3, QED=2

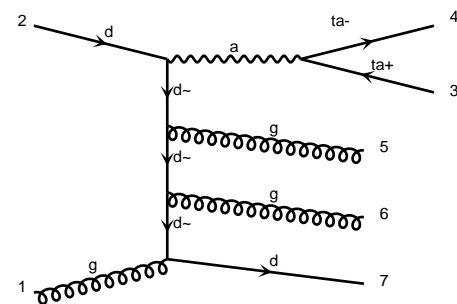


diagram 42      QCD=3, QED=2

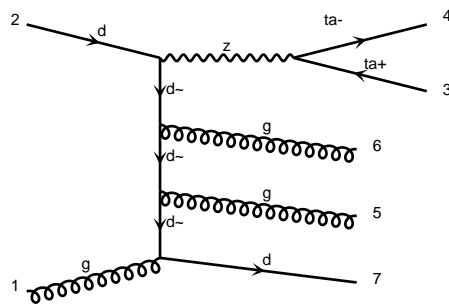


diagram 43                      QCD=3, QED=2

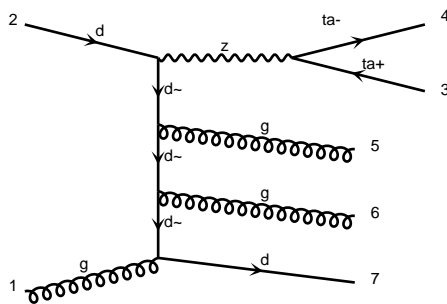


diagram 44                      QCD=3, QED=2

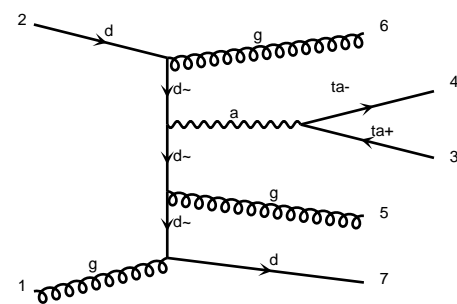


diagram 45      QCD=3, QED=2

The diagram shows a central quark loop (dashed line) with a gluon (curly line) entering from the left and a gluon (curly line) exiting to the right. Two photons (wavy lines) are emitted from the loop, labeled 3 and 4. The quark loop is labeled with 'd' and 'd~' at the vertices. The external lines are labeled 1, 2, 5, 6, 7, and 8. The vertices are labeled 'g' and 'd'.

The diagram shows a quark-antiquark annihilation process. An incoming quark (line 1, labeled 'd') and an incoming antiquark (line 2, labeled 'd-bar') annihilate at a vertex. From this vertex, a gluon (line 3, labeled 'g') is emitted. The quark line continues to a second vertex, from which a quark (line 4, labeled 'd') and a gluon (line 5, labeled 'g') emerge. The gluon (line 5) splits into a photon (line 6, labeled 'a') and a quark (line 7, labeled 'd'). The photon (line 6) then splits into a quark-antiquark pair (lines 3 and 4, labeled 'd' and 'd-bar').

The diagram shows a top quark line (labeled 't') entering from the top left and exiting from the top right. A gluon line (labeled 'g') enters from the bottom left and exits from the bottom right. A charm quark line (labeled 'c') forms a loop between the top and gluon lines. The top quark line is labeled 't' at the top left and 't' at the top right. The gluon line is labeled 'g' at the bottom left and 'g' at the bottom right. The charm quark line is labeled 'c' at the top left and 'c' at the bottom right. The diagram is labeled 't' at the top left and 't' at the top right.

The diagram shows a Z boson (wavy line) decaying into a quark-antiquark pair (solid lines) and a gluon-gluon pair (curly lines). The quark line is labeled 'd' and the antiquark line is labeled 'd-bar'. The gluon lines are labeled 'g'. The diagram is labeled with numbers 1 through 7, corresponding to the labels in the text.

The diagram shows a central horizontal gluon line (labeled 'g') with an arrow pointing to the right. This gluon line splits into two paths. The upper path consists of a quark line (labeled 'd' with an arrow pointing right) that then splits into two photon lines (labeled 'g' with curly braces). The lower path consists of a quark line (labeled 'a' with a wavy line) that forms a loop with a top quark line (labeled 'ta-' and 'ta+' with arrows pointing right). The loop then splits into two photon lines (labeled 'g' with curly braces). The final state consists of two photons (labeled 'g' with curly braces) and two quarks (labeled 'd' with arrows pointing right). The quarks are labeled with numbers 1, 2, 3, and 4. The photons are labeled with numbers 5 and 6. The quark lines are labeled 'd' and the photon lines are labeled 'g'.

[illegible]

The diagram shows a process with eight external lines and four internal vertices. 
 - External line 1 (bottom left) is a gluon (g) entering.
 - External line 2 (top left) is a quark (d) entering.
 - External line 3 (bottom right) is a quark (d) exiting.
 - External line 4 (top right) is a quark (d) exiting.
 - External line 5 (top middle) is a gluon (g) exiting.
 - External line 6 (middle left) is a gluon (g) exiting.
 - External line 7 (middle right) is a quark (d) exiting.
 - External line 8 (bottom right) is a quark (d) exiting.
 - Internal lines include a quark (d) line connecting the top-left vertex to the middle-left vertex, a gluon (g) line connecting the middle-left vertex to the top-middle vertex, a quark (d) line connecting the top-middle vertex to the middle-right vertex, and a gluon (g) line connecting the middle-right vertex to the bottom-right vertex.
 - A wavy line labeled 'a' connects the middle-right vertex to the bottom-right vertex.
 - Two additional lines labeled 'ta+' and 'ta-' branch off from the bottom-right vertex.

[illegible][illegible]

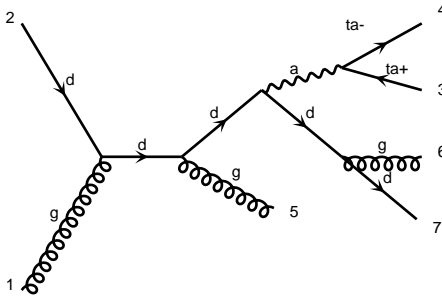


diagram 61 QCD=3, QED=2

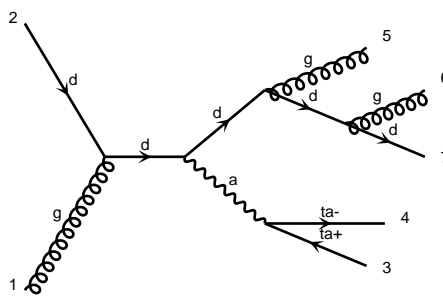


diagram 62 QCD=3, QED=2

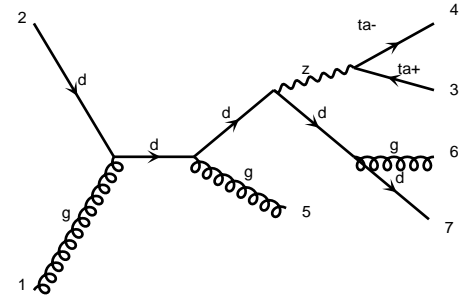


diagram 63 QCD=3, QED=2

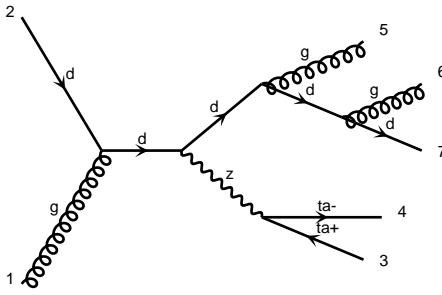


diagram 64 QCD=3, QED=2

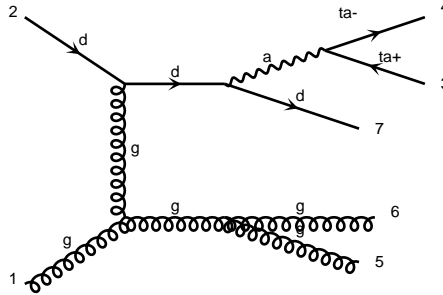


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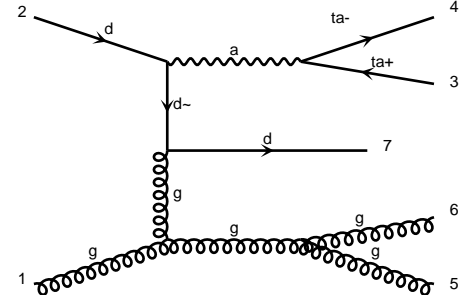


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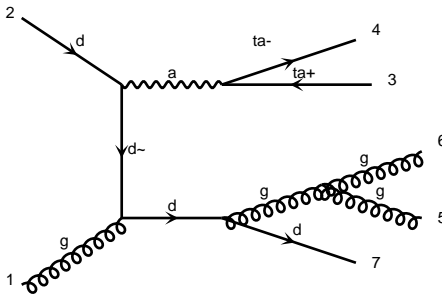


diagram 67 QCD=3, QED=2

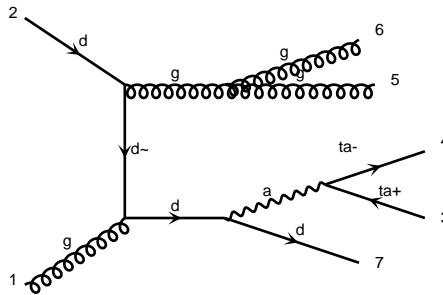


diagram 68 QCD=3, QED=2

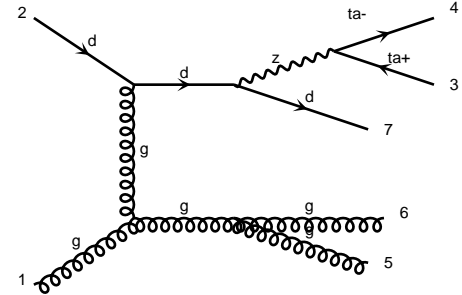


diagram 69 QCD=3, QED=2

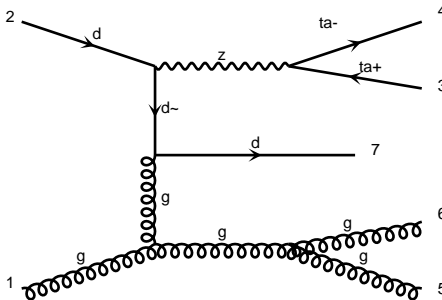


diagram 70 QCD=3, QED=2

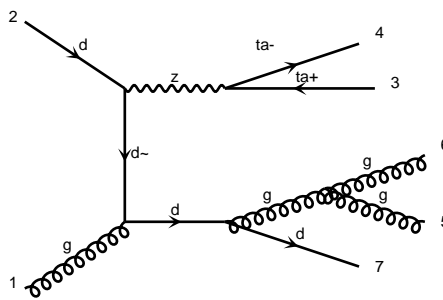


diagram 71 QCD=3, QED=2

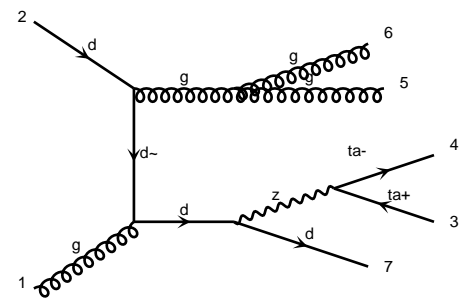


diagram 72 QCD=3, QED=2

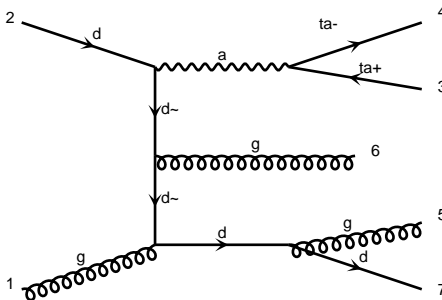


diagram 73 QCD=3, QED=2

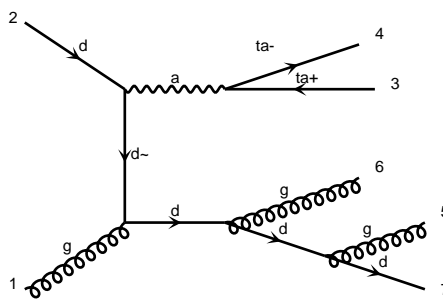


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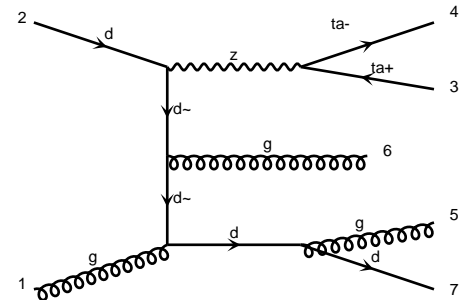


diagram 75 QCD=3, QED=2



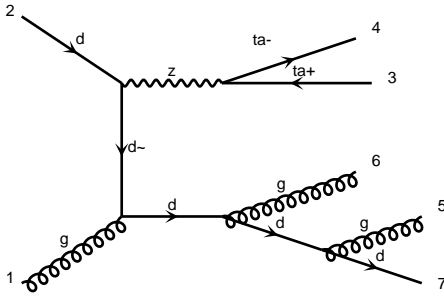


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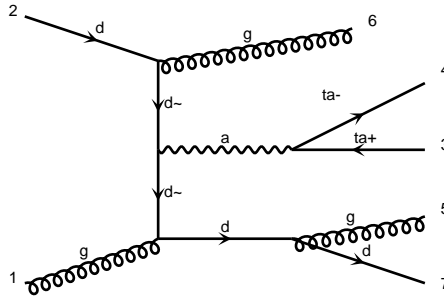


diagram 77 QCD=3, QED=2

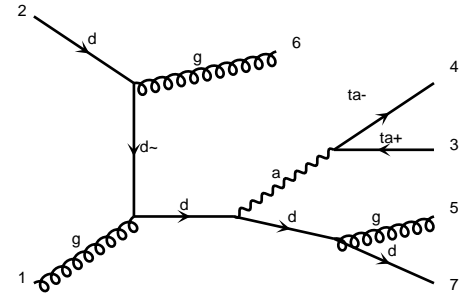


diagram 78 QCD=3, QED=2

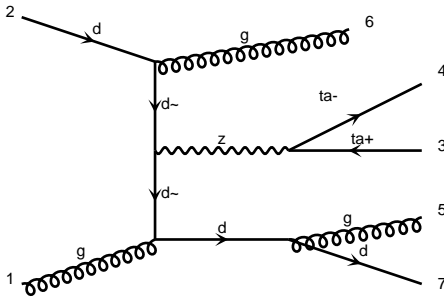


diagram 79 QCD=3, QED=2

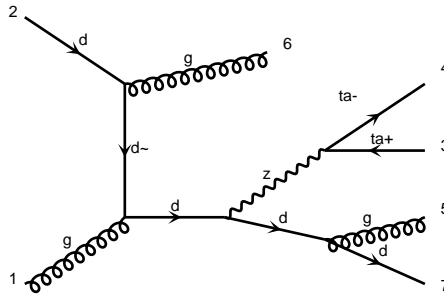


diagram 80 QCD=3, QED=2

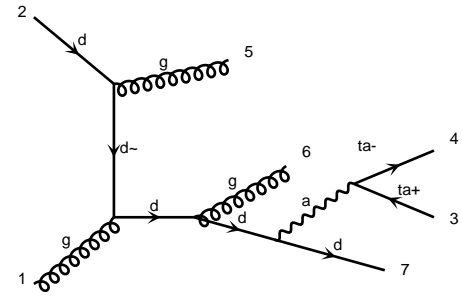


diagram 81 QCD=3, QED=2

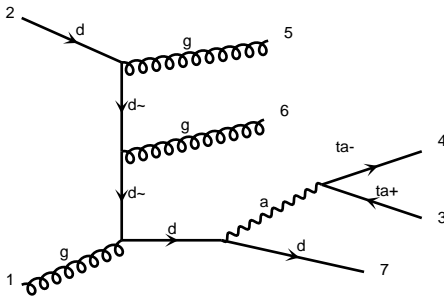


diagram 82 QCD=3, QED=2

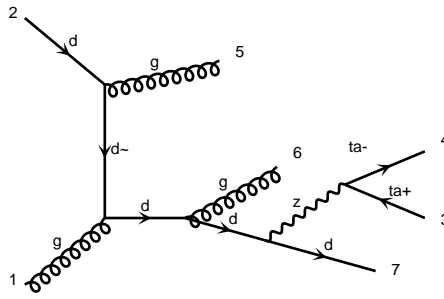


diagram 83 QCD=3, QED=2

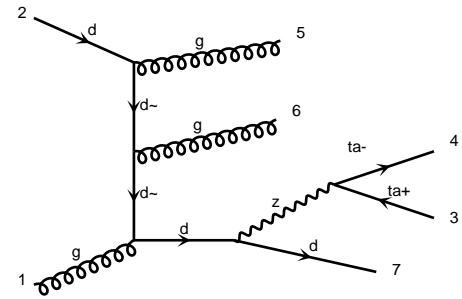


diagram 84 QCD=3, QED=2

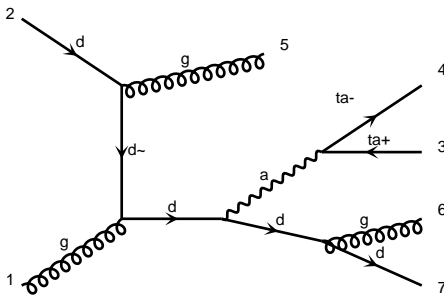


diagram 85 QCD=3, QED=2

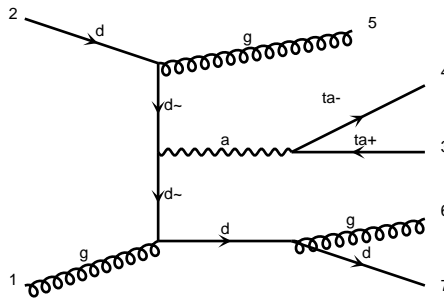


diagram 86 QCD=3, QED=2

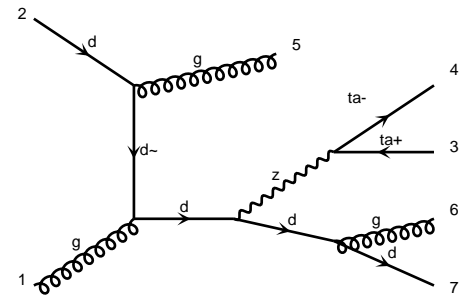


diagram 87 QCD=3, QED=2

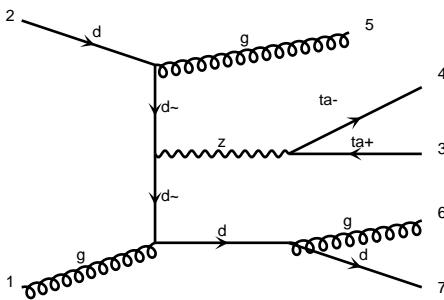


diagram 88 QCD=3, QED=2

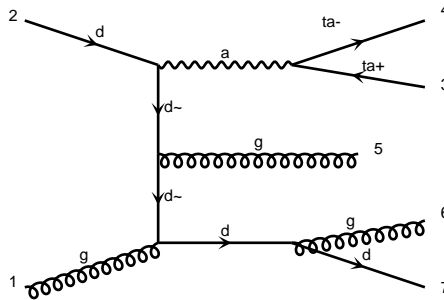


diagram 89 QCD=3, QED=2

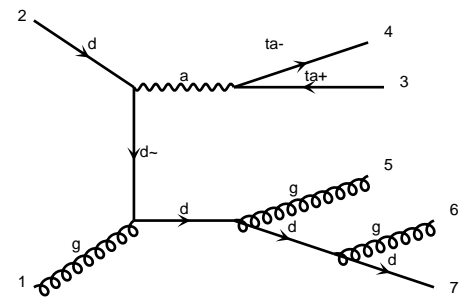


diagram 90 QCD=3, QED=2

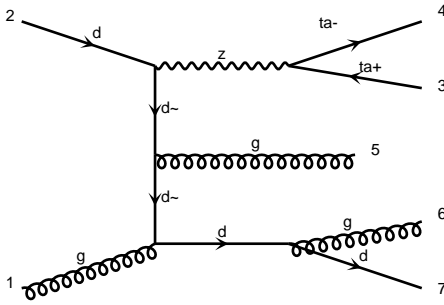


diagram 91 QCD=3, QED=2

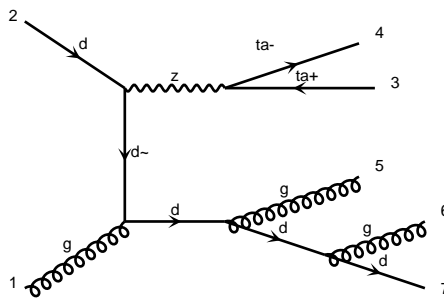


diagram 92 QCD=3, QED=2

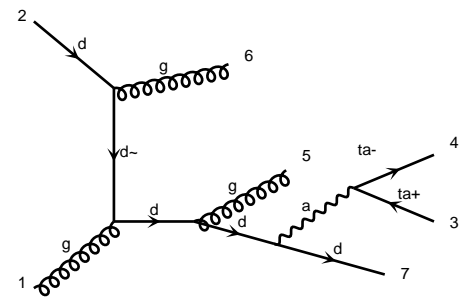


diagram 93 QCD=3, QED=2

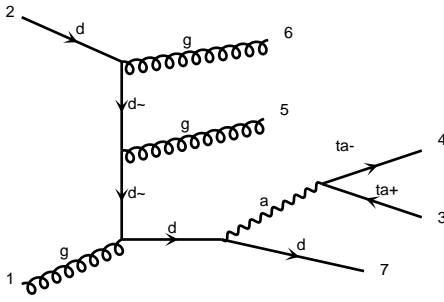


diagram 94 QCD=3, QED=2

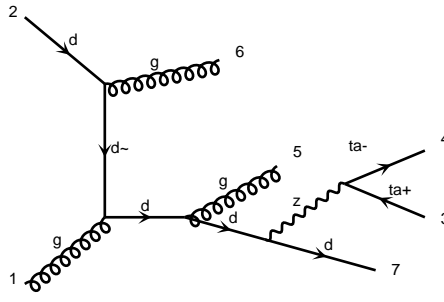


diagram 95 QCD=3, QED=2

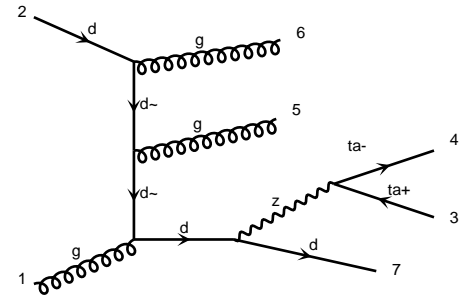


diagram 96 QCD=3, QED=2

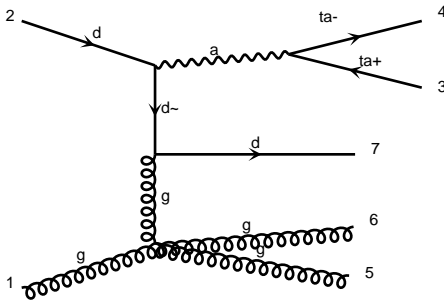


diagram 97 QCD=3, QED=2

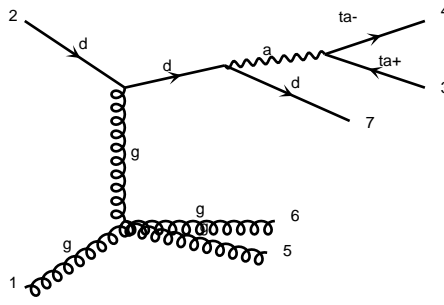


diagram 98 QCD=3, QED=2

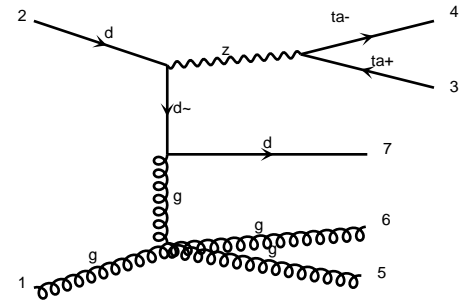


diagram 99 QCD=3, QED=2

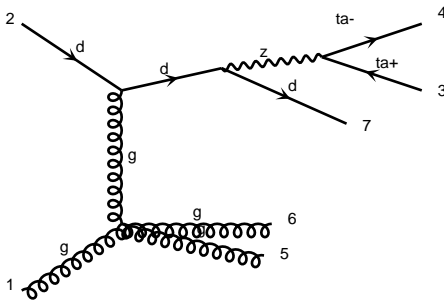


diagram 100 QCD=3, QED=2