

# The $\gamma_{ij}$ representation

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B[a[f_, j_, k_], \gamma[g_, j_, l_]] /; DQ[j, k, l] := 0;
B[a[f_, j_, k_], \gamma[g_, i_, k_]] /; DQ[i, j, k] := -\gamma[b_j f g, i, k] // LSimp;
B[a[f_, j_, k_], \gamma[g_, i_, j_]] /; DQ[i, j, k] := \gamma[b_j f g, i, k] // LSimp;
B[a[f_, j_, k_], \gamma[g_, k_, l_]] /; DQ[j, k, l] :=
  \gamma[b_j f g, k, l] - \gamma[b_k f g, j, l] // LSimp;
B[a[f_, j_, k_], \gamma[g_, l_, m_]] /; DQ[j, k, l, m] := 0;
B[a[f_, j_, k_], \gamma[g_, j_, k_]] := \gamma[-b_j f g, j, k] // LSimp;

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\beta[f[b_j, b_k]] \to \beta[f[b_j, b_k]] + \gamma\left[\frac{(-1+e^{-tb_j})(f^{(0,1)}[b_j, b_k]-f^{(1,0)}[b_j, b_k])}{b_j}, j, k\right],
\gamma[1, j, k] \to \gamma[e^{-tb_j}, j, k], \gamma[1, j, l] \to \gamma[1, j, l],
\gamma[1, i, k] \to \gamma[e^{-tb_j}, i, k], \gamma[1, i, j] \to \gamma[1, i, j] + \gamma[1 - e^{-tb_j}, i, k],
\gamma[1, i, l] \to \gamma[1, i, l], \gamma[1, j, l, m] \to \gamma[1, j, l, m],

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Missing:  $\gamma_{jl}, \gamma_{ij}, \gamma_{kl}$