Np = 0; (\* CHANGE WHEN NEEDED! \*)

Nd = 0;

Nc = 2;

(\* create lists of couplings \*)

lstp = {};

lstd = {};

lstc = {};

For[i = 1, i <= Np, i++,

ToExpression["AppendTo[lstp, g" <> ToString[i] <> "p]"];]

For[i = 1, i <= Nd, i++,

ToExpression["AppendTo[lstd, g" <> ToString[i] <> "d]"];]

For[i = 1, i <= Nc, i++,

ToExpression["AppendTo[lstc, g" <> ToString[i] <> "c]"];]

Print["List of couplings"];

Print[lstp];

Print[lstd];

Print[lstc];

couplings =

Expand[(Total[lstp] + Total[lstc])^2\*(Total[lstd] + Total[lstc])^2];

Print["Polynomial="];

Print[couplings];

List of couplings

{}

{}

{g1c,g2c}

Output

Polynomial=

g1c^4+4 g1c^3 g2c+6 g1c^2 g2c^2+4 g1c g2c^3+g2c^4

For Np=3, Nd=1

List of couplings

{g1p}

{g1d,g2d,g3d}

{}

Output

Polynomial=

g1d^2 g1p^2+2 g1d g1p^2 g2d+g1p^2 g2d^2+2 g1d g1p^2 g3d+2 g1p^2 g2d g3d+g1p^2 g3d^2