Computational Companion to “Flexible 3×3 Nets of Equimodular Elliptic Type” — Example 4

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Tested on: Mathematica 14.0

In[1480]:=

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(*==========================================================================
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(*Quit*)
(*All angle sets in degrees*)
anglesDeg = {
   {26.20863403213998, 82.2407675648952, 21.949109994264898, 60}, (*Vertex 1*)
   {16.166237389600262,
    130.87095233025335, 18.85247535405415, 115}, (*Vertex 2*)
   {134.65533802039442,
    34.44439013740831, 145.3694664686027, 80}, (*Vertex 3*)
   {117.95117201340666,
    49.52829397349284, 149.0275482144225, 105} (*Vertex 4*)};


(*------------------------------------------*)
(*Function to compute sigma from 4 angles*)
computeSigma[{α_, β_, γ_, δ_}] := (α + β + γ + δ) / 2;

(*------------------------------------------*)
(*Function to compute a,b,c,d from angles*)
computeABCD[{α_, β_, γ_, δ_}] :=
  Module[{alpha = α Degree, beta = β Degree, gamma = γ Degree,
    delta = δ Degree, sigma}, sigma = computeSigma[{α, β, γ, δ} Degree];
   {Sin[alpha] / Sin[sigma - alpha], Sin[beta] / Sin[sigma - beta],
    Sin[gamma] / Sin[sigma - gamma], Sin[delta] / Sin[sigma - delta]}];

(*------------------------------------------*)
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(*Compute all σ values*)
sigmas = computeSigma /@ anglesDeg;

(*Compute all {a,b,c,d} values*)
results = computeABCD /@ anglesDeg;

(*Optional:extract individual values*)
{a1, b1, c1, d1} = results⟦1⟧;
{a2, b2, c2, d2} = results⟦2⟧;
{a3, b3, c3, d3} = results⟦3⟧;
{a4, b4, c4, d4} = results⟦4⟧;
{σ1, σ2, σ3, σ4} = FullSimplify[sigmas];


(*============================================================================
 =====*)
(*================================
   CONDITION (N.0)=================================*)
(*============================================================================
 =====*)
(*uniqueCombos={{1,1,1,1},{1,1,1,-1},{1,1,-1,-1},
  {1,1,-1,1},{1,-1,1,1},{1,-1,-1,1},{1,-1,1,-1},{1,-1,-1,-1}};

checkConditionN0Degrees[{α_,β_,γ_,δ_}]:=Module[
  {angles={α,β,γ,δ},results},results=Mod[uniqueCombos.angles,360]//Chop;
  !MemberQ[results,0]];

conditionsN0=checkConditionN0Degrees/@anglesDeg;
allVerticesPass=And@@conditionsN0;

Column[{TextCell[Style["================= CONDITION (N.0) =================",
    Darker[Green],Bold, 16],"Text"],
  If[allVerticesPass,
   Style["✓ All vertices satisfy (N.0).",Darker[Green],Bold],
   Style["✘ Some vertices fail (N.0).",Red,Bold]]}]*)
uniqueCombos = {{1, 1, 1, 1}, {1, 1, 1, -1}, {1, 1, -1, -1}, {1, 1, -1, 1},
   {1, -1, 1, 1}, {1, -1, -1, 1}, {1, -1, 1, -1}, {1, -1, -1, -1}};

checkConditionN0Degrees[{α_, β_, γ_, δ_}] :=
  Module[{angles = {α, β, γ, δ}, results},
   results = Mod[uniqueCombos.angles, 360] // Chop;
   results];

(*apply to all vertices*)
resultsPerVertex = checkConditionN0Degrees /@ anglesDeg;

(*check pass/fail*)
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```
conditionsN0 = Map[! MemberQ[#, 0] &, resultsPerVertex];
allVerticesPass = And @@ conditionsN0;

Column[{TextCell[Style["================= CONDITION (N.0) =================",
     Darker[Green], Bold, 16], "Text"], (*summary line*) If[allVerticesPass,
    Style["✔ All vertices satisfy (N.0).", Darker[Green], Bold],
    Style["✘ Some vertices fail (N.0).", Red, Bold]],
   (*detailed results for each vertex*)
   Grid[Prepend[Table[{"Vertex " <> ToString[i], resultsPerVertex⟦i⟧,
       If[conditionsN0⟦i⟧, "✔ Pass", "✘ Fail"]}, {i, Length[anglesDeg]}],
     {"Vertex", "Combinations (mod 360)", "Status"}], Frame → All]}]


(*==========================================================================
 =====*)
(*================================
    CONDITION (N.3) ================================*)
(*==========================================================================
 =====*)
Ms = FullSimplify[Times @@@ results];
allEqualQ = Simplify[Equal @@ Ms];

Column[{TextCell[Style["================= CONDITION (N.3) =================",
     Darker[Blue], Bold, 16], "Text"], If[allEqualQ,
    Row[{Style["✔ M1 = M2 = M3 = M4 = ", Bold], Ms⟦1⟧}],
    Style["✘ M_i are not all equal.", Red, Bold]]}]


(*==========================================================================
 =====*)
(*==========================CONDITION (N.4) ==========================*)
(*==========================================================================
 =====*)
aList = results⟦All, 1⟧;
cList = results⟦All, 3⟧;
dList = results⟦All, 4⟧;

rList = FullSimplify /@ (aList * dList); {r1, r2, r3, r4} = rList;
sList = FullSimplify /@ (cList * dList); {s1, s2, s3, s4} = sList;

Column[{TextCell[Style["================= CONDITION (N.4) =================",
     Darker[Purple], Bold, 16], "Text"],
   If[r1 == r2 && r3 == r4 && s1 == s4 && s2 == s3, Column[
     {Row[{Style["✔ r1 = r2 = ", Bold], r1, Style["; ✔ r3 = r4 = ", Bold], r3}],
      Row[{Style["✔ s1 = s4 = ", Bold], s1, Style["; ✔ s2 = s3 = ", Bold],
        s2}]}], Style["✘ Condition (N.4) fails.", Red, Bold]]
 }]
```

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(*================================================================================
 =====*)
(*==================================
  CONDITION (N.5)================================*)
(*================================================================================
 =====*)
fList = FullSimplify /@ (aList * cList); {f1, f2, f3, f4} = fList;
M1 = Ms⟦1⟧;

m[M1_] := Piecewise[{{1 - M1, M1 < 1}, {(M1 - 1) / M1, M1 > 1}}] // N;
K = EllipticK[m[M1]] // N;
Kp = EllipticK[1 - m[M1]] // N;

computeTi[i_] :=
  Module[{sigma = sigmas⟦i⟧, r = rList⟦i⟧, s = sList⟦i⟧, f = fList⟦i⟧, base},
   base = I * Im[InverseJacobiDN[Piecewise[
         {{Sqrt[f], M1 < 1}, {1 / Sqrt[f], M1 > 1}}], m[M1]]] / Kp;
   Which[sigma < 180, Which[r > 1 && s > 1, base, (r < 1 && s > 1) || (r > 1 && s < 1),
     1 + base, r < 1 && s < 1, 2 + base], sigma > 180, Which[r > 1 && s > 1,
     2 + base, (r < 1 && s > 1) || (r > 1 && s < 1), 3 + base, r < 1 && s < 1, base]]];

tList = computeTi /@ Range[4];
RoundWithTolerance[x_, tol_ : 10 ^ (-14)] :=
  Module[{nearest}, nearest = Round[x];
   If[Abs[x - nearest] ≤ tol, nearest, x]];

checkValidCombination[M1_, ε_ : 10 ^ (-14)] :=
  Module[{i, combo, dotProd, rePart, imPart, n2, expr, foundQ = False},
   Print[Style["⚠ Approximate validation using ε-tolerance. For rigorous
       proof, see the referenced paper.", Darker@Orange, Italic]];
   Do[combo = uniqueCombos⟦i⟧;
    dotProd = tList.combo;
    rePart = Abs[Re[dotProd]];
    imPart = Abs[Im[dotProd]];
    If[M1 < 1,
     If[Mod[RoundWithTolerance[rePart], 4] < ε,
      If[Mod[RoundWithTolerance[imPart], 2] < ε, expr =
        tList⟦1⟧ + combo⟦2⟧ × tList⟦2⟧ + combo⟦3⟧ × tList⟦3⟧ + combo⟦4⟧ × tList⟦4⟧;
       Print[Style["✅ Valid Combination Found (M < 1):",
          Darker[Green], Bold], "\n", Style["e1 = ", Bold], combo⟦2⟧,
        Style[", e2 = ", Bold], combo⟦3⟧, Style[", e3 = ", Bold], combo⟦4⟧,
        "\n", Style["t1 = ", Bold], Re[tList⟦1⟧], "K + ", Im[tList⟦1⟧], "iK'",
        "\n", Style["t2 = ", Bold], Re[tList⟦2⟧], "K + ", Im[tList⟦2⟧], "iK'",
        "\n", Style["t3 = ", Bold], Re[tList⟦3⟧], "K + ", Im[tList⟦3⟧], "iK'",
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        "\n", Style["t4 = ", Bold], Re[tList[[4]]], "K + ", Im[tList[[4]]],
        "iK'", "\n", Style["t1 + e1*t2 + e2*t3 + e3*t4 = ", Bold],
        Re[expr], "K + ", Im[expr], "iK'"];
       foundQ = True;
       Break[]]]];
    If[M1 > 1,
     If[Mod[RoundWithTolerance[imPart], 2] < ε,
      n2 = Quotient[RoundWithTolerance[imPart], 2];
      If[Mod[RoundWithTolerance[Abs[rePart - 2 n2]], 4] < ε, expr =
        tList[[1]] + combo[[2]] × tList[[2]] + combo[[3]] × tList[[3]] + combo[[4]] × tList[[4]];
       Print[Style["✅ Valid Combination Found (M > 1):",
         Darker[Green], Bold], "\n", Style["e1 = ", Bold], combo[[2]],
        Style[", e2 = ", Bold], combo[[3]], Style[", e3 = ", Bold], combo[[4]],
        "\n", Style["t1 = ", Bold], Re[tList[[1]]], "K + ", Im[tList[[1]]], "iK'",
        "\n", Style["t2 = ", Bold], Re[tList[[2]]], "K + ", Im[tList[[2]]], "iK'",
        "\n", Style["t3 = ", Bold], Re[tList[[3]]], "K + ", Im[tList[[3]]], "iK'",
        "\n", Style["t4 = ", Bold], Re[tList[[4]]], "K + ", Im[tList[[4]]],
        "iK'", "\n", Style["t1 + e1*t2 + e2*t3 + e3*t4 = ", Bold],
        Re[expr], "K + ", Im[expr], "iK'"];
       foundQ = True;
       Break[]]]], {i, Length[uniqueCombos]}];
   If[! foundQ, Print[Style["❌ No valid combination found.", Red, Bold], "\n",
     Style["t1 = ", Bold], Re[tList[[1]]], "K + ", Im[tList[[1]]], "iK'", "\n",
     Style["t2 = ", Bold], Re[tList[[2]]], "K + ", Im[tList[[2]]], "iK'", "\n",
     Style["t3 = ", Bold], Re[tList[[3]]], "K + ", Im[tList[[3]]], "iK'", "\n",
     Style["t4 = ", Bold], Re[tList[[4]]], "K + ", Im[tList[[4]]], "iK'", "\n"]];];


Column[{TextCell[Style["================= CONDITION (N.5) =================",
    Darker[Red], Bold, 16], "Text"]}]
res = checkValidCombination[M1];


(*============================================================================
 =====*)
(*=================================
   OTHER PARAMETER==================================*)
(*============================================================================
 =====*)
cosSigmaAlt[Mi_, fi_, ri_, si_] :=
  (Mi (fi + ri + si - 1) + ri fi si - ri fi - ri si - fi si) / (2 Sqrt[ri si fi] (1 - Mi));

Column[
 {TextCell[Style["================= OTHER PARAMETERS =================",
    Darker[Orange], Bold, 16], "Text"],
  Row[{Style["u = ", Bold], 1 - M1}],
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  Row[{Style["σ1 = ", Bold], σ1 Degree, Style[", σ2 = ", Bold], σ2 Degree,
    Style[", σ3 = ", Bold], σ3 Degree, Style[", σ4 = ", Bold], σ4 Degree}],
  Row[{Style["σ1 ≈ ", Bold], N[σ1], Style["°", Bold], Style[", σ2 ≈ ", Bold],
    N[σ2], Style["°", Bold], Style[", σ3 ≈ ", Bold], N[σ3],
    Style["°", Bold], Style[", σ4 ≈ ", Bold], N[σ4], Style["°", Bold]}],
  Row[{Style["cosσ1 = ", Bold], Simplify@cosSigmaAlt[M1, f1, r1, s1],
    Style[", cosσ2 = ", Bold], Simplify@cosSigmaAlt[M1, f2, r2, s2],
    Style[", cosσ3 = ", Bold], Simplify@cosSigmaAlt[M1, f3, r3, s3],
    Style[", cosσ4 = ", Bold], Simplify@cosSigmaAlt[M1, f4, r4, s4]}],
  Row[{Style["f1 = ", Bold], f1, Style[", f2 = ", Bold],
    f2, Style[", f3 = ", Bold], f3, Style[", f4 = ", Bold], f4}],
  Row[{Style["z1 = ", Bold], FullSimplify[1 / (f1 - 1)], Style[", z2 = ", Bold],
    FullSimplify[1 / (f2 - 1)], Style[", z3 = ", Bold], FullSimplify[1 / (f3 - 1)],
    Style[", z4 = ", Bold], FullSimplify[1 / (f4 - 1)]}],
  Row[{Style["x1 = ", Bold], FullSimplify[1 / (r1 - 1)], Style[", x2 = ", Bold],
    FullSimplify[1 / (r2 - 1)], Style[", x3 = ", Bold], FullSimplify[1 / (r3 - 1)],
    Style[", x4 = ", Bold], FullSimplify[1 / (r4 - 1)]}],
  Row[{Style["y1 = ", Bold], FullSimplify[1 / (s1 - 1)], Style[", y2 = ", Bold],
    FullSimplify[1 / (s2 - 1)], Style[", y3 = ", Bold], FullSimplify[1 / (s3 - 1)],
    Style[", y4 = ", Bold], FullSimplify[1 / (s4 - 1)]}],
  Row[{Style["p1 = ", Bold], Simplify[Sqrt[r1 - 1]],
    Style[", p2 = ", Bold], Simplify[Sqrt[r2 - 1]], Style[", p3 = ", Bold],
    Simplify[Sqrt[r3 - 1]], Style[", p4 = ", Bold], Simplify[Sqrt[r4 - 1]]}],
  Row[{Style["q1 = ", Bold], Simplify[Sqrt[s1 - 1]],
    Style[", q2 = ", Bold], Simplify[Sqrt[s2 - 1]], Style[", q3 = ", Bold],
    Simplify[Sqrt[s3 - 1]], Style[", q4 = ", Bold], Simplify[Sqrt[s4 - 1]]}],
  Row[{Style["p1·q1 = ", Bold], Simplify[Sqrt[r1 - 1] Sqrt[s1 - 1]],
    Style[", p2·q2 = ", Bold], Simplify[Sqrt[r2 - 1] Sqrt[s2 - 1]],
    Style[", p3·q3 = ", Bold], Simplify[Sqrt[r3 - 1] Sqrt[s3 - 1]],
    Style[", p4·q4 = ", Bold], Simplify[Sqrt[r4 - 1] Sqrt[s4 - 1]]}]
 }]


(*==========================================================================
 =====*)
(*==============================
  BRICARD's EQUATIONS==============================*)
(*==========================================================================
 =====*)
(*==================================
 FLEXION 1==================================*)

Z[t_] := t;
W1[t_] := (1.8303883744906646` (0.739190870110122` t - 0.8185802872931142`
          Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
    (-1.226495086269229` - 3.4575776313801847` t^2);
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U[t_] := (0.18029302872898165` (11.610011024543208` t + 6.663793331850769`
        Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
    (2.6091661366212175` + 3.845171738795376` t^2);
W2[t_] := (0.8842187622039149` (0.8494336559689466` t - 1.1387226496890441`
        Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
    (-1.1465569838598522` - 3.4575776313801847` t^2);

(*General polynomial constructor*)
BricardsEquation[{α_, β_, γ_, δ_}, σ_, x_, y_] :=
  Module[{c22, c20, c02, c11, c00},
   c22 = Sin[σ - δ] Sin[σ - δ - β];
   c20 = Sin[σ - α] Sin[σ - α - β];
   c02 = Sin[σ - γ] Sin[σ - γ - β];
   c11 = -Sin[α] Sin[γ];
   c00 = Sin[σ] Sin[σ - β];
   c22 x^2 y^2 + c20 x^2 + c02 y^2 + 2 c11 x y + c00];

(*Compute and print all P_i for flexion 1*)
TextCell[
 Style["================= FLEXIBILITY (FLEXION 1) =================",
  Darker[Cyan], Bold, 16], "Text"]
funcs = {{Z, W1}, {Z, W2}, {U, W2}, {U, W1}};
Do[angles = anglesDeg[[i]] Degree;
  sigma = sigmas[[i]] Degree;
  {α, β, γ, δ} = angles;
  poly = Which[i == 1, BricardsEquation[{α, β, γ, δ}, sigma, Z[t], W1[t]],
    i == 2, BricardsEquation[{α, β, γ, δ}, sigma, Z[t], W2[t]],
    i == 3, BricardsEquation[{α, β, γ, δ}, sigma, U[t], W2[t]],
    i == 4, BricardsEquation[{α, β, γ, δ}, sigma, U[t], W1[t]]];
  Print[Row[{Subscript["P", i], "[", funcs[[i, 1]],
     ", ", funcs[[i, 2]], "] = ", FullSimplify[poly]}]], {i, 1, 4}];

(*t-range*)
tMin = 0;
tMax = 1;

(*Build P_i(t) consistently with your printing logic*)
Clear[PiExpr, labels, funcs];
funcs = {{Z, W1}, {Z, W2}, {U, W2}, {U, W1}};

PiExpr = Table[Module[{angles = anglesDeg[[i]] Degree,
      sigma = sigmas[[i]] Degree, α, β, γ, δ, poly}, {α, β, γ, δ} = angles;
     poly = BricardsEquation[{α, β, γ, δ}, sigma, funcs[[i, 1]][t], funcs[[i, 2]][t]];
     FullSimplify[poly]], {i, 1, 4}];
```

```
labels = Table[Row[{Subscript["P", i], "[",
     ToString@funcs[[i, 1]], ", ", ToString@funcs[[i, 2]], "]"}], {i, 1, 4}];

(*Pretty panel with plots like your style*)
Column[{TextCell[
   Style["================= FLEXIBILITY (FLEXION 1) =================",
    Darker[Cyan], Bold, 16], "Text"], TextCell[
   Style["Polynomials P_i(t) built from Bricard's equations for flexion 1.",
    GrayLevel[0.3]], "Text"], Spacer[12],
  Panel[GraphicsGrid[Partition[Table[Plot[Evaluate@PiExpr[[i]],
       {t, tMin, tMax}, PlotLabel → Style[labels[[i]], Bold, 14],
       PlotRange → {-10^(-13), 10^(-13)}, AxesLabel → {"t", None},
       ImageSize → 250], {i, Length[PiExpr]}], 2], Spacings → {2, 2}],
   Background → Lighter[Gray, 0.95], FrameMargins → 15]}]


(*==================================
 FLEXION 2==================================*)
Z2[t_] := t;
W12[t_] := (1.8303883744906646` (0.739190870110122` t + 0.8185802872931142`
       Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
   (-1.2264950862699229` - 3.4575776313801847` t^2);
U2[t_] := (0.18029302872898165` (11.610011024543208` t - 6.663793331850769`
       Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
   (2.6091661366212175` + 3.845171738795376` t^2);
W22[t_] := (0.8842187622039149` (0.8494336559689466` t + 1.1387226496890441`
       Sqrt[(1 + 3.4575776313801847` t^2) (1 - 0.7811714739558353` t^2)])) /
   (-1.1465569838598522` - 3.4575776313801847` t^2);

(*General polynomial constructor*)
BricardsEquation[{α_, β_, γ_, δ_}, σ_, x_, y_] :=
  Module[{c22, c20, c02, c11, c00},
   c22 = Sin[σ - δ] Sin[σ - δ - β];
   c20 = Sin[σ - α] Sin[σ - α - β];
   c02 = Sin[σ - γ] Sin[σ - γ - β];
   c11 = -Sin[α] Sin[γ];
   c00 = Sin[σ] Sin[σ - β];
    c22 x^2 y^2 + c20 x^2 + c02 y^2 + 2 c11 x y + c00];

(*Compute and print all P_i for flexion 2*)
TextCell[
 Style["================= FLEXIBILITY (FLEXION 2) =================",
  Cyan, Bold, 16], "Text"]
funcs = {{Z, W1}, {Z, W2}, {U, W2}, {U, W1}};
```

```
Do[angles = anglesDeg⟦i⟧ Degree;
  sigma = sigmas⟦i⟧ Degree;
  {α, β, γ, δ} = angles;
  poly = Which[i == 1, BricardsEquation[{α, β, γ, δ}, sigma, Z2[t], W12[t]],
    i == 2, BricardsEquation[{α, β, γ, δ}, sigma, Z2[t], W22[t]],
    i == 3, BricardsEquation[{α, β, γ, δ}, sigma, U2[t], W22[t]],
    i == 4, BricardsEquation[{α, β, γ, δ}, sigma, U2[t], W12[t]]];
  Print[Row[{Subscript["P", i], "[", funcs⟦i, 1⟧,
     ", ", funcs⟦i, 2⟧, "] = ", FullSimplify[poly]}]], {i, 1, 4}];

(*t-range*)
tMin = 0;
tMax = 1;

(*Build P_i(t) consistently with your printing logic*)
Clear[PiExpr, labels, funcs];
funcs = {{Z2, W12}, {Z2, W22}, {U2, W22}, {U2, W12}};

PiExpr = Table[Module[{angles = anglesDeg⟦i⟧ Degree,
     sigma = sigmas⟦i⟧ Degree, α, β, γ, δ, poly}, {α, β, γ, δ} = angles;
    poly = BricardsEquation[{α, β, γ, δ}, sigma, funcs⟦i, 1⟧[t], funcs⟦i, 2⟧[t]];
    FullSimplify[poly]], {i, 1, 4}];

labels = Table[Row[{Subscript["P", i], "[",
     ToString@funcs⟦i, 1⟧, ", ", ToString@funcs⟦i, 2⟧, "]"}], {i, 1, 4}];

(*Pretty panel with plots like your style*)
Column[{TextCell[
   Style["================= FLEXIBILITY (FLEXION 2) =================",
    Cyan, Bold, 16], "Text"], TextCell[
   Style["Polynomials P_i(t) built from Bricard’s equations for flexion 2.",
    GrayLevel[0.3]], "Text"], Spacer[12],
  Panel[GraphicsGrid[Partition[Table[Plot[Evaluate@PiExpr⟦i⟧,
       {t, tMin, tMax}, PlotLabel → Style[labels⟦i⟧, Bold, 14],
       PlotRange → {-10^(-13), 10^(-13)}, AxesLabel → {"t", None},
       ImageSize → 250], {i, Length[PiExpr]}], 2], Spacings → {2, 2}],
   Background → Lighter[Gray, 0.95], FrameMargins → 15]}]


(*=============================================================================
 =====*)
(*==================================
 NOT TRIVIAL==================================*)
(*=============================================================================
 =====*)
(*Define domain limits for t*)
tMin = 0;
```

```
tMax = 1;

(*===================================
 FLEXION 1==================================*)
(*List of expressions to plot*)
expressions = {Z[t], W2[t], U[t], W1[t]};
labels = {"Z", "W2", "U", "W1"};

Column[{TextCell[
   Style["================= NOT TRIVIAL (FLEXION 1) =================",
    Darker[Brown], Bold, 16], "Text"],

  (*Explanatory text*)
  TextCell[Style["This configuration does not belong to the trivial class –
      even after switching the boundary strips – since none of the
      functions Z, W2, U, or W1 is constant.", GrayLevel[0.3]], "Text"],
  Spacer[12],

  (*Plots in a light panel*)
  Panel[GraphicsGrid[Partition[Table[Plot[expressions⟦i⟧, {t, tMin, tMax},
       PlotLabel → Style[labels⟦i⟧, Bold, 14], PlotRange → All,
       AxesLabel → {"t", None}, ImageSize → 250], {i, Length[expressions]}], 2],
    Spacings → {2, 2}], Background → Lighter[Gray, 0.95], FrameMargins → 15]

 }]

(*===================================
 FLEXION 2==================================*)
(*Define domain limits for t*)
tMin = 0;
tMax = 1;
(*List of expressions to plot*)
expressions = {Z2[t], W22[t], U2[t], W12[t]};
labels = {"Z", "W2", "U", "W1"};

Column[{TextCell[
   Style["================= NOT TRIVIAL (FLEXION 2) =================",
    Brown, Bold, 16], "Text"],

  (*Explanatory text*)
  TextCell[Style["This configuration does not belong to the trivial class –
      even after switching the boundary strips – since none of the
      functions Z, W2, U, or W1 is constant.", GrayLevel[0.3]], "Text"],
  Spacer[12],

  (*Plots in a light panel*)
  Panel[GraphicsGrid[Partition[Table[Plot[expressions⟦i⟧, {t, tMin, tMax},
```

```
        PlotLabel → Style[labels⟦i⟧, Bold, 14], PlotRange → All,
        AxesLabel → {"t", None}, ImageSize → 250], {i, Length[expressions]}], 2],
    Spacings → {2, 2}], Background → Lighter[Gray, 0.95], FrameMargins → 15]

 }]


(*==========================================================================
 =====*)
(*===================
 NOT LINEAR COMPOUND & NOT LINEAR CONJUGATE==================*)
(*==========================================================================
 =====*)
(*Define domain limits for t*)
tMin = 0;
tMax = 1;

(*===================================
 FLEXION 1=================================*)
(*List of expressions& labels*)
expressions =
  {Z[t] * U[t], Z[t] / U[t], W1[t] * W2[t], W1[t] / W2[t], Z[t] * W2[t], Z[t] / W2[t],
   U[t] * W1[t], U[t] / W1[t], Z[t] * W1[t], Z[t] / W1[t], W2[t] * U[t], W2[t] / U[t]};
labels = {"Z * U", "Z / U", "W1 * W2", "W1 / W2", "Z * W2", "Z / W2",
   "U * W1", "U / W1", "Z * W1", "Z / W1", "W2 * U", "W2 / U"};

Column[
 {TextCell[Style["============= NOT LINEAR COMPOUND & NOT LINEAR CONJUGATE
      (FLEXION 1) =============", Darker[Magenta], Bold, 16], "Text"],

  (*Explanatory text*)TextCell[
   Style["This configuration does not belong to the Linear compound class nor
      to the linear conjugate class – even after switching the boundary
      strips – since none of the functions ZU, Z/U, W1W2, W1/W2, ZW2,
      Z/W2, UW1, and U/W1 is constant. In addition, none of ZW1,
      Z/W1, W2U, W2/U is constant as well.", GrayLevel[0.3]], "Text"],
  Spacer[12],

  (*Plots panel*)
  Panel[GraphicsGrid[Partition[Table[Plot[expressions⟦i⟧, {t, tMin, tMax},
        PlotLabel → Style[labels⟦i⟧, Bold, 14], PlotRange → All,
        AxesLabel → {"t", None}, ImageSize → 250], {i, Length[expressions]}], 2],
    Spacings → {2, 2}], Background → Lighter[Gray, 0.95], FrameMargins → 15]
 }]

(*===================================
 FLEXION 2=================================*)
```

```
(*Define domain limits for t*)
tMin = 0;
tMax = 0.65;
(*List of expressions& labels*)
expressions = {Z2[t] * U2[t], Z2[t] / U2[t], W12[t] * W22[t], W12[t] / W22[t],
   Z2[t] * W22[t], Z2[t] / W22[t], U2[t] * W12[t], U2[t] / W12[t],
   Z2[t] * W12[t], Z2[t] / W12[t], W22[t] * U2[t], W22[t] / U2[t]};
labels = {"Z * U", "Z / U", "W1 * W2", "W1 / W2", "Z * W2", "Z / W2",
   "U * W1", "U / W1", "Z * W1", "Z / W1", "W2 * U", "W2 / U"};

Column[
 {TextCell[Style["============= NOT LINEAR COMPOUND & NOT LINEAR CONJUGATE
      (FLEXION 2) =============", Magenta, Bold, 16], "Text"],

  (*Explanatory text*)TextCell[
   Style["This configuration does not belong to the Linear compound class nor
      to the linear conjugate class – even after switching the boundary
      strips – since none of the functions ZU, Z/U, W1W2, W1/W2, ZW2,
      Z/W2, UW1, and U/W1 is constant. In addition, none of ZW1,
      Z/W1, W2U, W2/U is constant as well.", GrayLevel[0.3]], "Text"],
  Spacer[12],

  (*Plots panel*)
  Panel[GraphicsGrid[Partition[Table[Plot[expressions⟦i⟧, {t, tMin, tMax},
       PlotLabel → Style[labels⟦i⟧, Bold, 14], PlotRange → All,
       AxesLabel → {"t", None}, ImageSize → 250], {i, Length[expressions]}], 2],
    Spacings → {2, 2}], Background → Lighter[Gray, 0.95], FrameMargins → 15]
 }]


(*==========================================================================
 =====*)
(*==========================
 SWITCHING BOUNDARY STRIPS==========================*)
(*==========================================================================
 =====*)
SwitchingRightBoundaryStrip[anglesDeg_List] := Module[{modified = anglesDeg},
  (*Indices:{row,column}={1,2},{1,3},{4,2},{4,3}*)
  modified⟦1, 2⟧ = 180 - anglesDeg⟦1, 2⟧; (*β1*)
  modified⟦1, 3⟧ = 180 - anglesDeg⟦1, 3⟧; (*γ1*)
  modified⟦4, 2⟧ = 180 - anglesDeg⟦4, 2⟧; (*β4*)
  modified⟦4, 3⟧ = 180 - anglesDeg⟦4, 3⟧; (*γ4*)
  modified]

SwitchingLeftBoundaryStrip[anglesDeg_List] := Module[{modified = anglesDeg},
  (*Indices:{row,column}={2,2},{2,3},{3,2},{3,3}*)
  modified⟦2, 2⟧ = 180 - anglesDeg⟦2, 2⟧; (*β2*)
```

```
  modified⟦2, 3⟧ = 180 - anglesDeg⟦2, 3⟧; (*γ2*)
  modified⟦3, 2⟧ = 180 - anglesDeg⟦3, 2⟧; (*β3*)
  modified⟦3, 3⟧ = 180 - anglesDeg⟦3, 3⟧; (*γ3*)
  modified]

SwitchingLowerBoundaryStrip[anglesDeg_List] := Module[{modified = anglesDeg},
  (*Indices:{row,column}={1,1},{1,2},{2,1},{2,2}*)
  modified⟦1, 1⟧ = 180 - anglesDeg⟦1, 1⟧; (*α1*)
  modified⟦1, 2⟧ = 180 - anglesDeg⟦1, 2⟧; (*β1*)
  modified⟦2, 1⟧ = 180 - anglesDeg⟦2, 1⟧; (*α2*)
  modified⟦2, 2⟧ = 180 - anglesDeg⟦2, 2⟧; (*β2*)
  modified]

SwitchingUpperBoundaryStrip[anglesDeg_List] := Module[{modified = anglesDeg},
  (*Indices:{row,column}={3,1},{3,2},{4,1},{4,2}*)
  modified⟦3, 1⟧ = 180 - anglesDeg⟦3, 1⟧; (*α3*)
  modified⟦3, 2⟧ = 180 - anglesDeg⟦3, 2⟧; (*β3*)
  modified⟦4, 1⟧ = 180 - anglesDeg⟦4, 1⟧; (*α4*)
  modified⟦4, 2⟧ = 180 - anglesDeg⟦4, 2⟧; (*β4*)
  modified]


(*==========================================================================
 =====*)
(*==================================
   NOT CONIC=====================================*)
(*==========================================================================
 =====*)
uniqueCombos = {{1, 1, 1, 1}, {1, 1, 1, -1}, {1, 1, -1, -1}, {1, 1, -1, 1},
   {1, -1, 1, 1}, {1, -1, -1, 1}, {1, -1, 1, -1}, {1, -1, -1, -1}};

checkConditionN0Degrees[{α_, β_, γ_, δ_}] :=
  Module[{angles = {α, β, γ, δ}, results},
   results = Mod[uniqueCombos.angles, 360] // Chop;
   ! MemberQ[results, 0]];

conditionsN0 = checkConditionN0Degrees /@ anglesDeg;
allVerticesPass = And @@ conditionsN0;

Column[{TextCell[Style["================= NOT CONIC =================",
    Pink, Bold, 16], "Text"],
  TextCell[Style["Condition (N.0) is satisfied ⇒
      this configuration is NOT equimodular-conic. Applying
      any boundary-strip switch still preserves (N.0), so
      no conic form emerges.", GrayLevel[0.3]], "Text"]
 }]
```

```
(*Now the exact same Module for checking all switch combinations…*)
Module[{angles = anglesDeg, switchers, combinations, results},
 (*Define switch functions*)
 switchers = <|"Right" → SwitchingRightBoundaryStrip,
   "Left" → SwitchingLeftBoundaryStrip, "Lower" → SwitchingLowerBoundaryStrip,
   "Upper" → SwitchingUpperBoundaryStrip|>;
 (*Generate all combinations of switches (from size 1 to 4)*)
 combinations = Subsets[Keys[switchers], {1, Length[switchers]}];
 (*Evaluate condition after each combination of switches*)results = Table[
   Module[{switched = angles, name, passQ}, name = StringRiffle[combo, " + "];
    Do[switched = switchers[sw][switched], {sw, combo}];
    passQ = And @@ (checkConditionN0Degrees /@ switched);
    (*Print the result after switching*)
    (*Print["\nSwitch combination: ",name];
    Print["Switched anglesDeg:"];
    Print[MatrixForm[switched]];*)
    {name, passQ}], {combo, combinations}];
 (*Display results*)
 Column[Prepend[Table[Module[{comboName = res⟦1⟧, passQ = res⟦2⟧},
     Row[{Style[comboName <> ": ", Bold],
       If[passQ,
        Style["Condition (N.0) is still satisfied.", Darker[Green]],
        Style["Condition (N.0) fails.", Red, Bold]
       ]
      }
     ]], {res, results}], TextCell[
    Style["CONDITION (N.0) AFTER SWITCHING BOUNDARY STRIPS", 14], "Text"]]]]


(*============================================================================
 =====*)
(*================================
 NOT ORTHODIAGONAL================================*)
(*============================================================================
 =====*)
Column[
 {TextCell[Style["================= NOT ORTHODIAGONAL =================",
    Purple, Bold, 16], "Text"],
  TextCell[Style[
    "cos(αi)·cos(γi) ≠ cos(βi)·cos(δi) for each i = 1…4 ⇒ NOT orthodiagonal.
      Switching boundary strips does not
      correct this.", GrayLevel[0.3]], "Text"]
 }]

Module[{angles = anglesDeg, switchers, combinations, results},
 (*Define switch functions*)
 switchers = <|"Right" → SwitchingRightBoundaryStrip,
```

```
    "Left" → SwitchingLeftBoundaryStrip, "Lower" → SwitchingLowerBoundaryStrip,
    "Upper" → SwitchingUpperBoundaryStrip|>;
  (*Helper function:compute and print difference only*)
  formatOrthodiagonalCheck[quad_List] := Module[{vals},
    vals = Table[Module[{a, b, c, d, lhs, rhs, diff}, {a, b, c, d} = quad[[i]];
       lhs = FullSimplify[Cos[a Degree] Cos[c Degree]];
       rhs = FullSimplify[Cos[b Degree] Cos[d Degree]];
       diff = Chop[lhs - rhs];
       Style[Row[{"cos(α" <> ToString[i] <> ")·cos(γ" <> ToString[i] <> ") - ",
          "cos(β" <> ToString[i] <> ")·cos(δ" <> ToString[i] <> ") = ", NumberForm[
           diff, {5, 3}]}], If[diff == 0, Red, Black]]], {i, Length[quad]}];
    Column[vals]];
  (*Orthodiagonal check for anglesDeg before any switching*)
  Print[TextCell[Style["\nInitial anglesDeg (no switches):", Bold]]];
  Print[MatrixForm[angles]];
  Print[TextCell[Style[
     "Orthodiagonal check: cos(αi)·cos(γi) - cos(βi)·cos(δi) for i = 1..4",
     Italic]]];
  Print[formatOrthodiagonalCheck[angles]];
  (*Generate all combinations of switches (from size 1 to 4)*)
  combinations = Subsets[Keys[switchers], {1, Length[switchers]}];
  (*Evaluate condition after each combination of switches*)results = Table[
    Module[{switched = angles, name, passQ}, name = StringRiffle[combo, " + "];
     Do[switched = switchers[sw][switched], {sw, combo}];
     passQ = And @@ (checkConditionN0Degrees /@ switched);
     Print[Style["\nSwitch combination: ", Bold], name];
     Print[Style["Switched anglesDeg:", Italic]];
     Print[MatrixForm[switched]];
     Print[TextCell[Style[
        "Orthodiagonal check: cos(αi)·cos(γi) - cos(βi)·cos(δi) for i = 1..4",
        Italic]]];
     Print[formatOrthodiagonalCheck[switched]];
     {name, passQ}], {combo, combinations}];]


(*==========================================================================
 =====*)
(*=================================
 NOT ISOGONAL=================================*)
(*==========================================================================
 =====*)
Column[
 {TextCell[Style["================= NOT ISOGONAL =================", Orange,
    Bold, 15], "Text"],
  TextCell[
   Style["Condition (N.0) holds AND for all i = 1…4: αi ≠ βi, αi ≠ γi, αi
      ≠ δi, βi ≠ γi, βi ≠ δi, γi ≠ δi, αi+βi ≠ π ≠ γi+δi, αi+γi
```

```
    ≠ π ≠ βi+δi, αi+δi ≠ π ≠ βi+γi ⇒ NOT isogonal. Switching
    boundary strips do not change this.", GrayLevel[0.3]], "Text"]}]

Module[{angles = anglesDeg, switchers, combinations, results},
 (*Define switch functions*)
 switchers = <|"Right" → SwitchingRightBoundaryStrip,
   "Left" → SwitchingLeftBoundaryStrip, "Lower" → SwitchingLowerBoundaryStrip,
   "Upper" → SwitchingUpperBoundaryStrip|>;
 (*Helper function:extended angle relations*)
 formatAngleRelations[quad_List] :=
  Module[{vals}, vals = Table[Module[{a, b, c, d, exprs}, {a, b, c, d} = quad[[i]];
      exprs = {Row[{"α" <> ToString[i] <> " - β" <> ToString[i] <> " = ",
          NumberForm[N[a - b], {5, 3}]}], Row[{"α" <> ToString[i] <>
           " - γ" <> ToString[i] <> " = ", NumberForm[N[a - c], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " - δ" <> ToString[i] <> " = ",
          NumberForm[N[a - d], {5, 3}]}], Row[{"β" <> ToString[i] <>
           " - γ" <> ToString[i] <> " = ", NumberForm[N[b - c], {5, 3}]}],
        Row[{"β" <> ToString[i] <> " - δ" <> ToString[i] <> " = ",
          NumberForm[N[b - d], {5, 3}]}], Row[{"γ" <> ToString[i] <>
           " - δ" <> ToString[i] <> " = ", NumberForm[N[c - d], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + β" <> ToString[i] <> " - 180 = ",
          NumberForm[N[a + b - 180], {5, 3}]}],
        Row[{"γ" <> ToString[i] <> " + δ" <> ToString[i] <> " - 180 = ",
          NumberForm[N[c + d - 180], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + γ" <> ToString[i] <> " - 180 = ",
          NumberForm[N[a + c - 180], {5, 3}]}],
        Row[{"β" <> ToString[i] <> " + δ" <> ToString[i] <> " - 180 = ",
          NumberForm[N[b + d - 180], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + δ" <> ToString[i] <> " - 180 = ",
          NumberForm[N[a + d - 180], {5, 3}]}],
        Row[{"β" <> ToString[i] <> " + γ" <> ToString[i] <> " - 180 = ",
          NumberForm[N[b + c - 180], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + β" <> ToString[i] <> " - γ" <> ToString[i] <>
           " - δ" <> ToString[i] <> " = ", NumberForm[N[a + b - c - d], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + γ" <> ToString[i] <> " - β" <> ToString[i] <>
           " - δ" <> ToString[i] <> " = ", NumberForm[N[a + c - b - d], {5, 3}]}],
        Row[{"α" <> ToString[i] <> " + δ" <> ToString[i] <> " - β" <> ToString[i] <>
           " - γ" <> ToString[i] <> " = ", NumberForm[N[a + d - b - c], {5, 3}]}]};
      Column[Prepend[exprs, Style["Vertex " <> ToString[i], Bold]]]],
     {i, Length[quad]}];
   Column[vals, Spacings → 1.5]];
 (*Angle relation check for anglesDeg before any switching*)
 Print[TextCell[Style["\nInitial anglesDeg (no switches):", Bold]]];
 Print[MatrixForm[angles]];
 Print[TextCell[Style["Angle relation checks for i = 1..4:", Italic]]];
 Print[formatAngleRelations[angles]];
 (*Generate all combinations of switches (from size 1 to 4)*)
```

```
combinations = Subsets[Keys[switchers], {1, Length[switchers]}];
(*Evaluate condition after each combination of switches*)results = Table[
  Module[{switched = angles, name, passQ}, name = StringRiffle[combo, " + "];
   Do[switched = switchers[sw][switched], {sw, combo}];
   passQ = And @@ (checkConditionN0Degrees /@ switched);
   Print[Style["\nSwitch combination: ", Bold], name];
   Print[Style["Switched anglesDeg:", Italic]];
   Print[MatrixForm[switched]];
   Print[TextCell[Style["Angle relation checks for i = 1..4:", Italic]]];
   Print[formatAngleRelations[switched]];
   {name, passQ}], {combo, combinations}];]


(*==========================================================================
 =====*)
(*===========================
  NOT CONJUGATE-MODULAR=============================*)
(*==========================================================================
 =====*)
Column[
 {TextCell[Style["================= NOT CONJUGATE-MODULAR =================",
    Brown, Bold, 16], "Text"],
  TextCell[Style[
    "M1 = M2 = M3 = M4 = M and M ≠ 2 ⇒ NOT conjugate-modular. Boundary-strip
      switches preserve this.", GrayLevel[0.3]], "Text"]
 }]
Ms = FullSimplify[Times @@@ results];
allEqualQ = Simplify[Equal @@ Ms];

Module[{angles = anglesDeg, switchers, combinations, results,
  computeConjugateModularInfo}, (*Define switch functions*)
 switchers = <|"Right" → SwitchingRightBoundaryStrip,
   "Left" → SwitchingLeftBoundaryStrip, "Lower" → SwitchingLowerBoundaryStrip,
   "Upper" → SwitchingUpperBoundaryStrip|>;
 (*Computes Mi and pi and prints them,
 with classification*)computeConjugateModularInfo[quad_List] :=
  Module[{abcdList, Ms, summary}, abcdList = computeABCD /@ quad;
   Ms = FullSimplify[Times @@@ abcdList];
   summary = If[Simplify[Equal @@ Ms] && Ms[[1]] =!= 2,
     Style["M1 = M2 = M3 = M4 = M and M ≠ 2", Bold],
     Style["M1 = M2 = M3 = M4 = M and M = 2", Red, Bold]];
   Column[{Style["Mi values:", Bold], Row[{"M1 = ", Ms[[1]], ", M2 = ",
       Ms[[2]], ", M3 = ", Ms[[3]], ", M4 = ", Ms[[4]]}], summary}]];
 (*Original anglesDeg check*)
 Print[
  TextCell[Style["\nInitial configuration (no switches applied):", Bold]]];
 Print[MatrixForm[angles]];
```

```
Print[computeConjugateModularInfo[angles]];
(*Generate all switch combinations (from size 1 to 4)*)
combinations = Subsets[Keys[switchers], {1, Length[switchers]}];
(*Evaluate each switched configuration*)results = Table[
  Module[{switched = angles, name, passQ}, name = StringRiffle[combo, " + "];
   Do[switched = switchers[sw][switched], {sw, combo}];
   passQ = And @@ (checkConditionN0Degrees /@ switched);
   Print[Style["\nSwitch combination: ", Bold], name];
   Print[Style["Switched anglesDeg:", Italic]];
   Print[MatrixForm[switched]];
   Print[computeConjugateModularInfo[switched]];
   {name, passQ}], {combo, combinations}];]



(*============================================================================
=====*)
(*==================================
NOT CHIMERA==================================*)
(*============================================================================
=====*)
Column[
 {TextCell[Style["================= NOT CHIMERA =================", Blue,
    Bold, 16], "Text"],
  TextCell[
   Style["Fails conic, orthodiagonal & isogonal tests for all i=1, ...,
      4 ⇒ NOT chimera. Boundary-strip switches preserve these
      failures as demonstrated in the NOT CONIC, NOT ORTHODIAGONAL,
      and NOT ISOGONAL sections.", GrayLevel[0.3]], "Text"]
}]
```

Out[1495]=

================= CONDITION (N.0) =================

✔ All vertices satisfy (N.0).

Vertex	Combinations (mod 360)	Status
Vertex 1	{190.399, 70.3985, 26.5003, 146.5, 25.917, 342.019, 265.917, 222.019}	✔ Pass
Vertex 2	{280.89, 50.8897, 13.1847, 243.185, 19.1478, 341.443, 149.148, 111.443}	✔ Pass
Vertex 3	{34.4692, 234.469, 303.73, 103.73, 325.58, 34.8415, 165.58, 234.841}	✔ Pass
Vertex 4	{61.507, 211.507, 273.452, 123.452, 322.45, 24.3953, 112.45, 174.395}	✔ Pass

Out[1498]=

================= CONDITION (N.3) =================

✔ **M1 = M2 = M3 = M4** = 1.22593

Out[1504]=

================= CONDITION (N.4) =================

✔ **r1** = **r2** = 0.71078; ✔ **r3** = **r4** = 0.887609

✔ **s1** = **s4** = 0.58646; ✔ **s2** = **s3** = 0.800228

Out[1514]=

================= CONDITION (N.5) =================

⚠ *Approximate validation using*
ε-tolerance. For rigorous proof, see the referenced paper.

✅ Valid Combination Found (M > 1):

e1 = -1, **e2** = -1, **e3** = 1

t1 = 2.K + 0.801037iK'

t2 = 2.K + 0.837691iK'

t3 = 0.K + 0.579573iK'

t4 = 0.K + 0.616227iK'

t1 + **e1*t2** + **e2*t3** + **e3*t4** = 0.K + 2.33147×10^{-15}iK'

Out[1517]=

================= OTHER PARAMETERS =================

u = -0.22593

σ1 = 1.66154, **σ2** = 2.45122, **σ3** = 3.44239, **σ4** = 3.67834

σ1 ≈ 95.1993°, **σ2** ≈ 140.445°, **σ3** ≈ 197.235°, **σ4** ≈ 210.754°

cosσ1 = -0.0906196, **cosσ2** = -0.771012, **cosσ3** = -0.9551, **cosσ4** = -0.859375

f1 = 0.184669, **f2** = 0.127824, **f3** = 0.578993, **f4** = 0.516796

z1 = -1.2265, **z2** = -1.14656, **z3** = -2.37526, **z4** = -2.06952

x1 = -3.45758, **x2** = -3.45758, **x3** = -8.89754, **x4** = -8.89754

y1 = -2.41814, **y2** = -5.00571, **y3** = -5.00571, **y4** = -2.41814

p1 = 0. + 0.537792 i , **p2** = 0. + 0.537792 i
, **p3** = 0. + 0.335247 i , **p4** = 0. + 0.335247 i

q1 = 0. + 0.643071 i , **q2** = 0. + 0.446958 i
, **q3** = 0. + 0.446958 i , **q4** = 0. + 0.643071 i

p1·q1 = -0.345838 + 0. i, **p2·q2** = -0.24037 + 0. i
, **p3·q3** = -0.149841 + 0. i, **p4·q4** = -0.215588 + 0. i

Out[1523]=

================= FLEXIBILITY (FLEXION 1) =================

$$P_1[Z,\ W1] = \frac{1}{\left(0.354727 + 1.\ t^2\right)^2}\left(-1.12836\times10^{-16} + t\left(7.63278\times10^{-17}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(-8.55179\times10^{-16} - 1.52032\times10^{-15}\ t^2 + 1.9004\times10^{-16}\ t^4 + 3.88578\times10^{-16}\ t\sqrt{1+2.67641\ t^2-2.70096\ t^4}\right)\right)\right)$$

$$P_2[Z,\ W2] = \frac{1}{\left(0.331607 + 1.\ t^2\right)^2}\left(-1.0532\times10^{-17} + t\left(-2.08167\times10^{-17}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(-1.89577\times10^{-16} - 5.6873\times10^{-16}\ t^2 - 1.0532\times10^{-16}\ t^4 + 7.63278\times10^{-17}\ t\sqrt{1+2.67641\ t^2-2.70096\ t^4}\right)\right)\right)$$

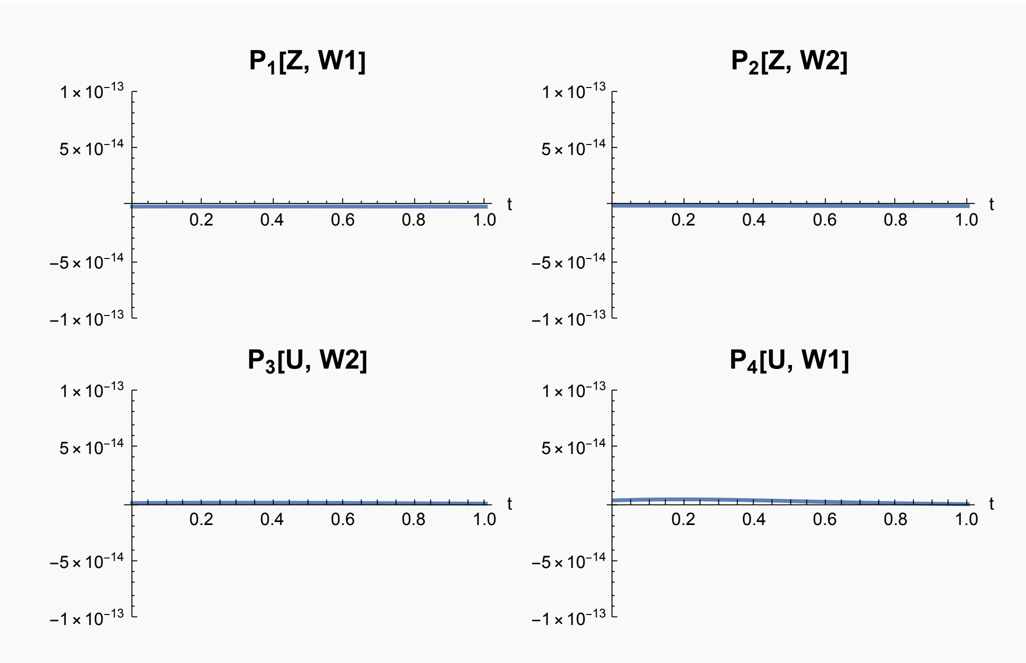
$$P_3[U,\ W2] = \frac{1}{\left(0.225014 + 1.01016\ t^2 + 1.\ t^4\right)^2}\left(8.02692\times10^{-17} + t\left(9.7296\times10^{-17}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(6.42255\times10^{-16} + t\left(4.21616\times10^{-16}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(1.82917\times10^{-15} + 1.66701\times10^{-15}\ t^2 + 2.20538\times10^{-16}\ t^4 + 4.54048\times10^{-16}\ t\sqrt{1+2.67641\ t^2-2.70096\ t^4}\right)\right)\right)\right)\right)$$

$$P_4[U,\ W1] = \frac{1}{\left(0.240702 + 1.03328\ t^2 + 1.\ t^4\right)^2}\left(2.31221\times10^{-16} + t\left(4.95008\times10^{-16}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(1.00956\times10^{-15} + t\left(1.30265\times10^{-15}\sqrt{1+2.67641\ t^2-2.70096\ t^4} + t\left(9.90016\times10^{-16} - 1.0812\times10^{-15}\ t^2 - 2.60531\times10^{-16}\ t^4 + 4.81982\times10^{-16}\ t\sqrt{1+2.67641\ t^2-2.70096\ t^4}\right)\right)\right)\right)\right)$$

Out[1532]=

================= FLEXIBILITY (FLEXION 1) =================

Polynomials P_i(t) built from Bricard's equations for flexion 1.



Out[1538]=

================= FLEXIBILITY (FLEXION 2) =================

$$P_1[Z, W1] = \frac{1}{\left(0.354727 + 1.\, t^2\right)^2} \left(-1.12836 \times 10^{-16} + t \left(-7.63278 \times 10^{-17} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(-8.55179 \times 10^{-16} - 1.52032 \times 10^{-15}\, t^2 + 1.9004 \times 10^{-16}\, t^4 - 3.88578 \times 10^{-16}\, t \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4}\right)\right)\right)$$

$$P_2[Z, W2] = \frac{1}{\left(0.331607 + 1.\, t^2\right)^2} \left(-1.0532 \times 10^{-17} + t \left(2.08167 \times 10^{-17} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(-1.89577 \times 10^{-16} - 5.6873 \times 10^{-16}\, t^2 - 1.0532 \times 10^{-16}\, t^4 - 7.63278 \times 10^{-17}\, t \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4}\right)\right)\right)$$

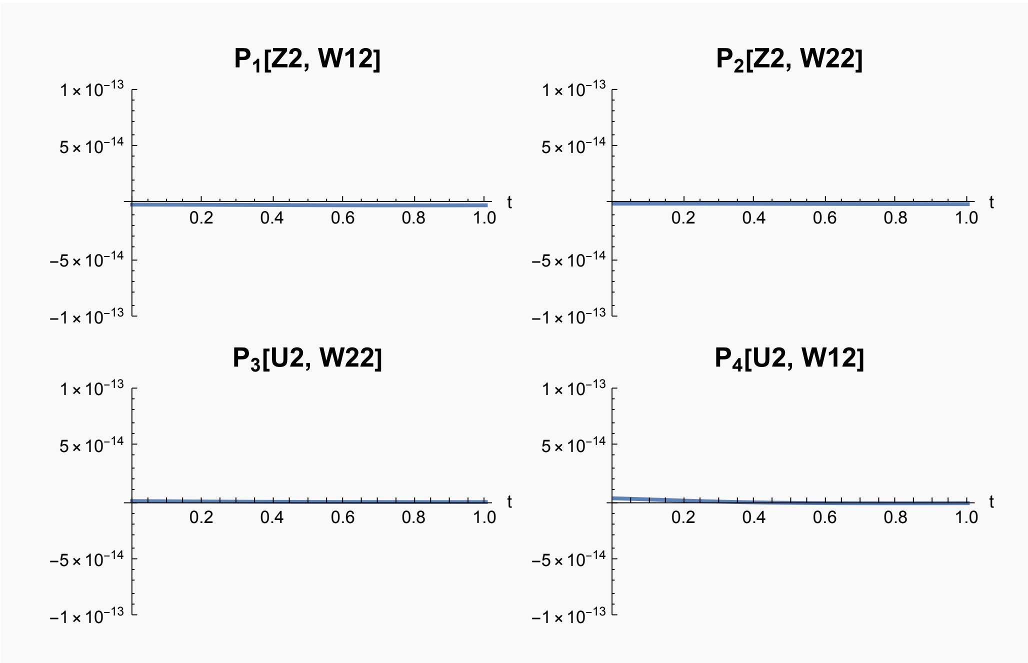
$$P_3[U, W2] = \frac{1}{\left(0.225014 + 1.01016\, t^2 + 1.\, t^4\right)^2} \left(8.02692 \times 10^{-17} + t \left(-9.7296 \times 10^{-17} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(6.42255 \times 10^{-16} + t \left(-4.21616 \times 10^{-16} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(1.82917 \times 10^{-15} + 1.66701 \times 10^{-15}\, t^2 + 2.20538 \times 10^{-16}\, t^4 - 4.54048 \times 10^{-16}\, t \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4}\right)\right)\right)\right)\right)$$

$$P_4[U, W1] = \frac{1}{\left(0.240702 + 1.03328\, t^2 + 1.\, t^4\right)^2} \left(2.31221 \times 10^{-16} + t \left(-4.95008 \times 10^{-16} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(1.00956 \times 10^{-15} + t \left(-1.30265 \times 10^{-15} \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4} + t \left(9.90016 \times 10^{-16} - 1.0812 \times 10^{-15}\, t^2 - 2.60531 \times 10^{-16}\, t^4 - 4.81982 \times 10^{-16}\, t \sqrt{1 + 2.67641\, t^2 - 2.70096\, t^4}\right)\right)\right)\right)\right)$$

Out[1547]=

================= FLEXIBILITY (FLEXION 2) =================

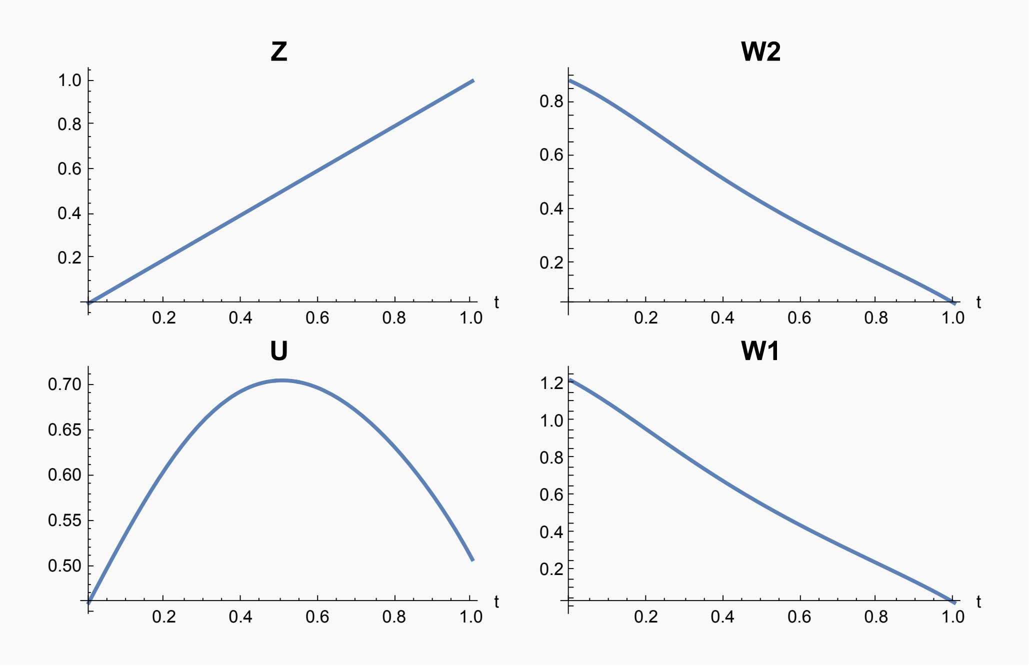
Polynomials P_i(t) built from Bricard’s equations for flexion 2.



Out[1552]=

================= NOT TRIVIAL (FLEXION 1) =================

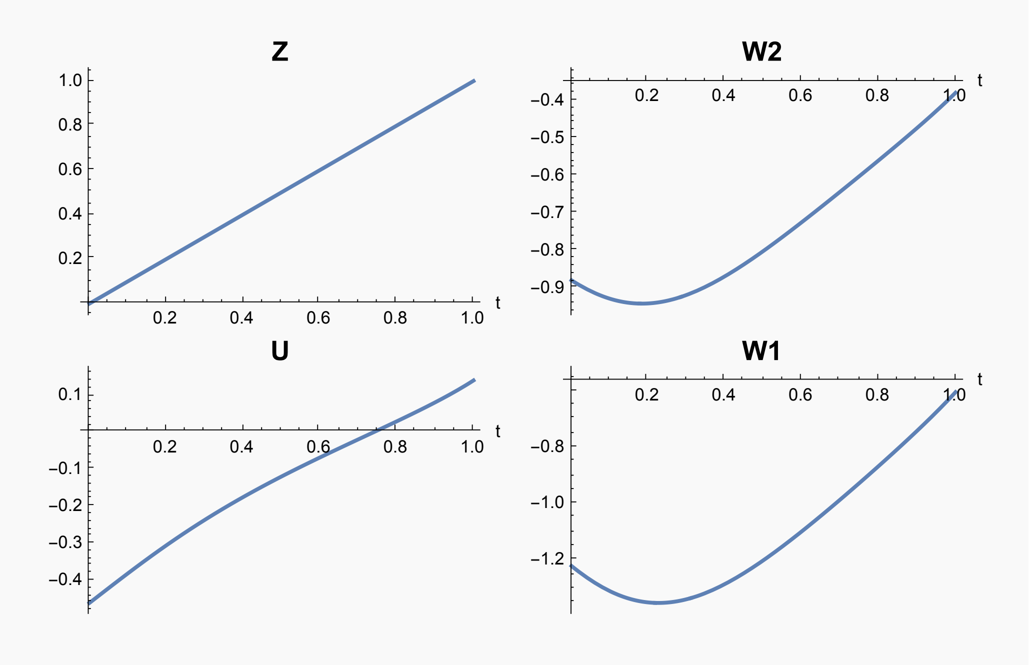
This configuration does not belong to the trivial
class — even after switching the boundary strips —
since none of the functions Z, W2, U, or W1 is constant.



Out[1557]=

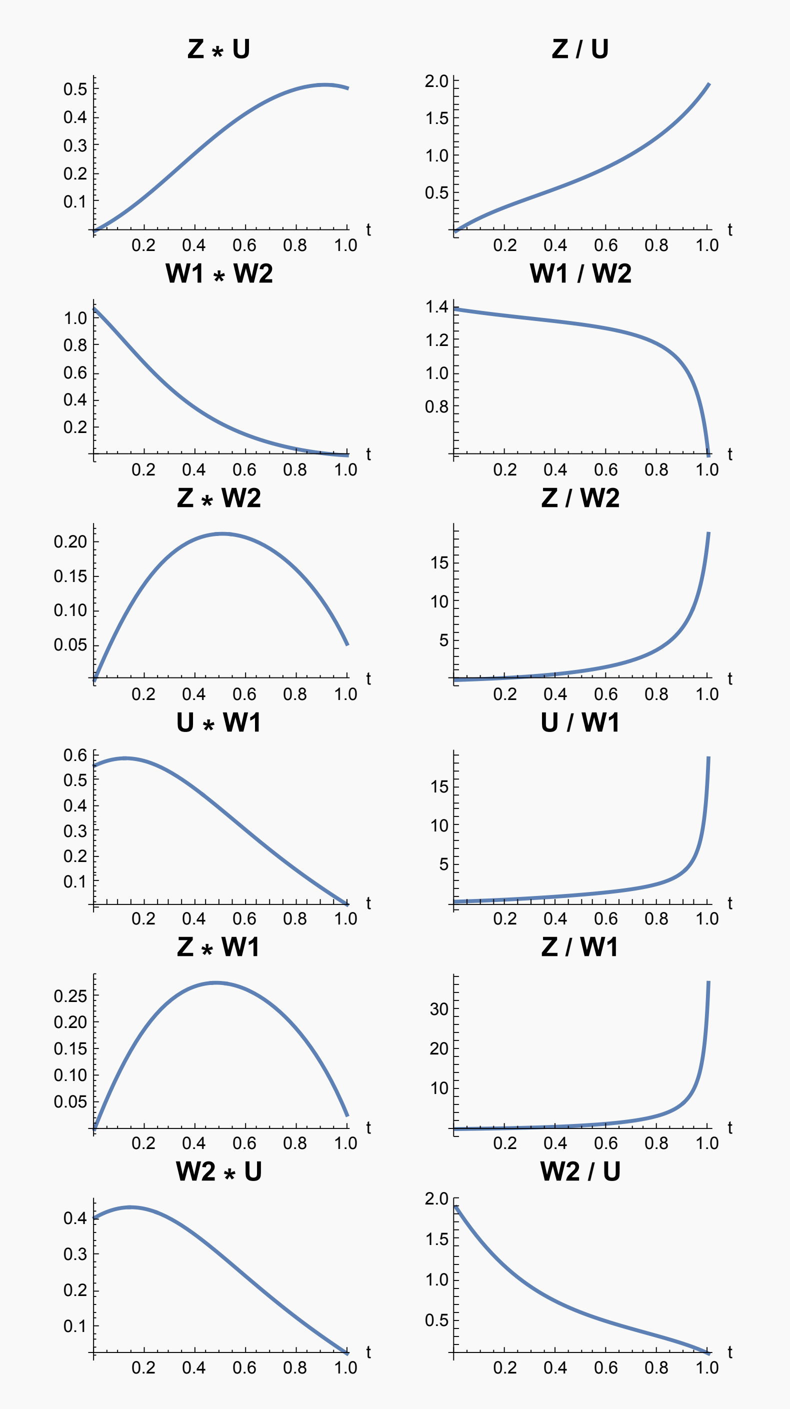
================= **NOT TRIVIAL (FLEXION 2)** =================

This configuration does not belong to the trivial class — even after switching the boundary strips — since none of the functions Z, W2, U, or W1 is constant.



Out[1562]=

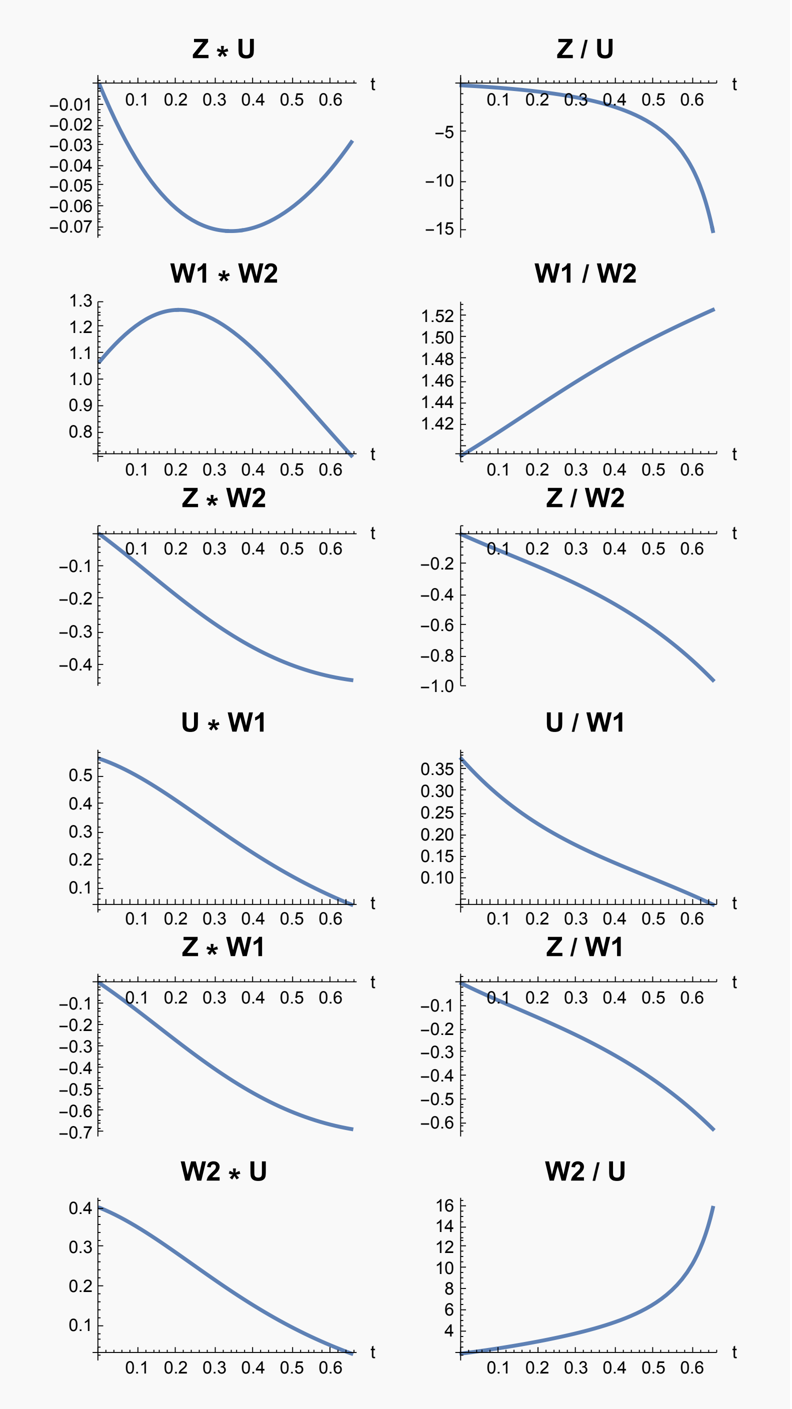
```
============= NOT LINEAR COMPOUND &
  NOT LINEAR CONJUGATE (FLEXION 1) =============
This configuration does not belong to the Linear compound class
  nor to the linear conjugate class – even after switching
  the boundary strips – since none of the functions ZU, Z/U,
  W1W2, W1/W2, ZW2, Z/W2, UW1, and U/W1 is constant. In
  addition, none of ZW1, Z/W1, W2U, W2/U is constant as well.
```



Out[1567]=

============= NOT LINEAR COMPOUND &
NOT LINEAR CONJUGATE (FLEXION 2) =============

This configuration does not belong to the Linear compound class nor to the linear conjugate class — even after switching the boundary strips — since none of the functions ZU, Z/U, W1W2, W1/W2, ZW2, Z/W2, UW1, and U/W1 is constant. In addition, none of ZW1, Z/W1, W2U, W2/U is constant as well.



Out[1576]=

================= NOT CONIC =================

Condition (N.0) is satisfied ⇒ this configuration is NOT equimodular-conic. Applying any boundary-strip switch still preserves (N.0), so no conic form emerges.

Out[1577]=

CONDITION (N.0) AFTER SWITCHING BOUNDARY STRIPS

Right: Condition (N.0) is still satisfied.
Left: Condition (N.0) is still satisfied.
Lower: Condition (N.0) is still satisfied.
Upper: Condition (N.0) is still satisfied.
Right + Left: Condition (N.0) is still satisfied.
Right + Lower: Condition (N.0) is still satisfied.
Right + Upper: Condition (N.0) is still satisfied.
Left + Lower: Condition (N.0) is still satisfied.
Left + Upper: Condition (N.0) is still satisfied.
Lower + Upper: Condition (N.0) is still satisfied.
Right + Left + Lower: Condition (N.0) is still satisfied.
Right + Left + Upper: Condition (N.0) is still satisfied.
Right + Lower + Upper: Condition (N.0) is still satisfied.
Left + Lower + Upper: Condition (N.0) is still satisfied.
Right + Left + Lower + Upper: Condition (N.0) is still satisfied.

Out[1578]=

================= NOT ORTHODIAGONAL =================

$\cos(\alpha_i)\cdot\cos(\gamma_i) \neq \cos(\beta_i)\cdot\cos(\delta_i)$ for each i = 1…4 ⇒ NOT orthodiagonal. Switching boundary strips does not correct this.

Initial anglesDeg (no switches):

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = 0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = 0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = 0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = 0.570$

Switch combination: Right

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = -0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = 0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = 0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = -0.570$

Switch combination: Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = 0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = 0.570$

Switch combination: Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = -0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = 0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = 0.570$

Switch combination: Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = 0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = 0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = -0.570$

Switch combination: Right + Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for i = 1..4*

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = -0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = -0.570$

Switch combination: Right + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = 0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = -0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = 0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = -0.570$

Switch combination: Right + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = -0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = 0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = -0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = 0.570$

Switch combination: Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = -0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = 0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = -0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = 0.570$

Switch combination: Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha 1)\cdot\cos(\gamma 1) - \cos(\beta 1)\cdot\cos(\delta 1) = 0.765$
$\cos(\alpha 2)\cdot\cos(\gamma 2) - \cos(\beta 2)\cdot\cos(\delta 2) = -0.632$
$\cos(\alpha 3)\cdot\cos(\gamma 3) - \cos(\beta 3)\cdot\cos(\delta 3) = 0.435$
$\cos(\alpha 4)\cdot\cos(\gamma 4) - \cos(\beta 4)\cdot\cos(\delta 4) = -0.570$

Switch combination: Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = -0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = -0.570$

Switch combination: Right + Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = 0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = 0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = -0.570$

Switch combination: Right + Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = -0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = 0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = 0.570$

Switch combination: Right + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = 0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = -0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = -0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = 0.570$

Switch combination: Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = -0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = 0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = 0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = -0.570$

Switch combination: Right + Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Orthodiagonal check: $\cos(\alpha_i)\cdot\cos(\gamma_i) - \cos(\beta_i)\cdot\cos(\delta_i)$ *for* $i = 1..4$

$\cos(\alpha1)\cdot\cos(\gamma1) - \cos(\beta1)\cdot\cos(\delta1) = 0.765$
$\cos(\alpha2)\cdot\cos(\gamma2) - \cos(\beta2)\cdot\cos(\delta2) = 0.632$
$\cos(\alpha3)\cdot\cos(\gamma3) - \cos(\beta3)\cdot\cos(\delta3) = 0.435$
$\cos(\alpha4)\cdot\cos(\gamma4) - \cos(\beta4)\cdot\cos(\delta4) = 0.570$

Out[1580]=

================= NOT ISOGONAL =================

Condition (N.0) holds AND for all i = 1…4: $\alpha_i \neq \beta_i$, $\alpha_i \neq \gamma_i$, $\alpha_i \neq \delta_i$, $\beta_i \neq \gamma_i$, $\beta_i \neq \delta_i$, $\gamma_i \neq \delta_i$, $\alpha_i+\beta_i \neq \pi \neq \gamma_i+\delta_i$, $\alpha_i+\gamma_i \neq \pi \neq \beta_i+\delta_i$, $\alpha_i+\delta_i \neq \pi \neq \beta_i+\gamma_i \Rightarrow$ NOT isogonal. Switching boundary strips do not change this.

Initial anglesDeg (no switches):

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for $i = 1..4$:

Vertex 1

$\alpha1 - \beta1 = -56.032$
$\alpha1 - \gamma1 = 4.260$
$\alpha1 - \delta1 = -33.791$
$\beta1 - \gamma1 = 60.292$
$\beta1 - \delta1 = 22.241$
$\gamma1 - \delta1 = -38.051$
$\alpha1 + \beta1 - 180 = -71.551$
$\gamma1 + \delta1 - 180 = -98.051$
$\alpha1 + \gamma1 - 180 = -131.840$
$\beta1 + \delta1 - 180 = -37.759$
$\alpha1 + \delta1 - 180 = -93.791$
$\beta1 + \gamma1 - 180 = -75.810$
$\alpha1 + \beta1 - \gamma1 - \delta1 = 26.500$
$\alpha1 + \gamma1 - \beta1 - \delta1 = -94.083$
$\alpha1 + \delta1 - \beta1 - \gamma1 = -17.981$

Vertex 2

$\alpha2 - \beta2 = -114.700$

$\alpha 2 - \beta 2 = -114.706$
$\alpha 2 - \gamma 2 = -2.686$
$\alpha 2 - \delta 2 = -98.834$
$\beta 2 - \gamma 2 = 112.020$
$\beta 2 - \delta 2 = 15.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = -32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = -144.980$
$\beta 2 + \delta 2 - 180 = 65.871$
$\alpha 2 + \delta 2 - 180 = -48.834$
$\beta 2 + \gamma 2 - 180 = -30.277$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 13.185$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = -210.850$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -18.557$

Vertex 3
$\alpha 3 - \beta 3 = 100.210$
$\alpha 3 - \gamma 3 = -10.714$
$\alpha 3 - \delta 3 = 54.655$
$\beta 3 - \gamma 3 = -110.930$
$\beta 3 - \delta 3 = -45.556$
$\gamma 3 - \delta 3 = 65.369$
$\alpha 3 + \beta 3 - 180 = -10.900$
$\gamma 3 + \delta 3 - 180 = 45.369$
$\alpha 3 + \gamma 3 - 180 = 100.020$
$\beta 3 + \delta 3 - 180 = -65.556$
$\alpha 3 + \delta 3 - 180 = 34.655$
$\beta 3 + \gamma 3 - 180 = -0.186$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -56.270$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = 165.580$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.841$

Vertex 4
$\alpha 4 - \beta 4 = 68.423$
$\alpha 4 - \gamma 4 = -31.076$
$\alpha 4 - \delta 4 = 12.951$
$\beta 4 - \gamma 4 = -99.499$
$\beta 4 - \delta 4 = -55.472$
$\gamma 4 - \delta 4 = 44.028$
$\alpha 4 + \beta 4 - 180 = -12.521$
$\gamma 4 + \delta 4 - 180 = 74.028$
$\alpha 4 + \gamma 4 - 180 = 86.979$
$\beta 4 + \delta 4 - 180 = -25.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = 18.556$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -86.548$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = 112.450$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 24.395$

Switch combination: Right

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = -71.551$
$\alpha 1 - \gamma 1 = -131.840$

$\alpha 1 - \gamma 1 = -131.840$
$\alpha 1 - \delta 1 = -33.791$
$\beta 1 - \gamma 1 = -60.292$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = 98.051$
$\alpha 1 + \beta 1 - 180 = -56.032$
$\gamma 1 + \delta 1 - 180 = 38.051$
$\alpha 1 + \gamma 1 - 180 = 4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = -93.791$
$\beta 1 + \gamma 1 - 180 = 75.810$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = -94.083$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 26.500$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -169.600$

Vertex 2
$\alpha 2 - \beta 2 = -114.700$
$\alpha 2 - \gamma 2 = -2.686$
$\alpha 2 - \delta 2 = -98.834$
$\beta 2 - \gamma 2 = 112.020$
$\beta 2 - \delta 2 = 15.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = -32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = -144.980$
$\beta 2 + \delta 2 - 180 = 65.871$
$\alpha 2 + \delta 2 - 180 = -48.834$
$\beta 2 + \gamma 2 - 180 = -30.277$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 13.185$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = -210.850$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -18.557$

Vertex 3
$\alpha 3 - \beta 3 = 100.210$
$\alpha 3 - \gamma 3 = -10.714$
$\alpha 3 - \delta 3 = 54.655$
$\beta 3 - \gamma 3 = -110.930$
$\beta 3 - \delta 3 = -45.556$
$\gamma 3 - \delta 3 = 65.369$
$\alpha 3 + \beta 3 - 180 = -10.900$
$\gamma 3 + \delta 3 - 180 = 45.369$
$\alpha 3 + \gamma 3 - 180 = 100.020$
$\beta 3 + \delta 3 - 180 = -65.556$
$\alpha 3 + \delta 3 - 180 = 34.655$
$\beta 3 + \gamma 3 - 180 = -0.186$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -56.270$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = 165.580$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.841$

Vertex 4
$\alpha 4 - \beta 4 = -12.521$
$\alpha 4 - \gamma 4 = 86.979$
$\alpha 4 - \delta 4 = 12.951$
$\beta 4 - \gamma 4 = 99.499$
$\beta 4 - \delta 4 = 25.472$
$\gamma 4 - \delta 4 = -74.028$
$\alpha 4 + \beta 4 - 180 = 68.423$
$\gamma 4 + \delta 4 - 180 = -44.028$
$\alpha 4 + \gamma 4 - 180 = -31.076$
$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = -18.556$

$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = 112.450$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -86.548$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 61.507$

Switch combination: Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1

$\alpha 1 - \beta 1 = -56.032$
$\alpha 1 - \gamma 1 = 4.260$
$\alpha 1 - \delta 1 = -33.791$
$\beta 1 - \gamma 1 = 60.292$
$\beta 1 - \delta 1 = 22.241$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = -71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -131.840$
$\beta 1 + \delta 1 - 180 = -37.759$
$\alpha 1 + \delta 1 - 180 = -93.791$
$\beta 1 + \gamma 1 - 180 = -75.810$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 26.500$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = -94.083$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -17.981$

Vertex 2

$\alpha 2 - \beta 2 = -32.963$
$\alpha 2 - \gamma 2 = -144.980$
$\alpha 2 - \delta 2 = -98.834$
$\beta 2 - \gamma 2 = -112.020$
$\beta 2 - \delta 2 = -65.871$
$\gamma 2 - \delta 2 = 46.148$
$\alpha 2 + \beta 2 - 180 = -114.700$
$\gamma 2 + \delta 2 - 180 = 96.148$
$\alpha 2 + \gamma 2 - 180 = -2.686$
$\beta 2 + \delta 2 - 180 = -15.871$
$\alpha 2 + \delta 2 - 180 = -48.834$
$\beta 2 + \gamma 2 - 180 = 30.277$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = -210.850$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 13.185$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -79.110$

Vertex 3

$\alpha 3 - \beta 3 = -10.900$
$\alpha 3 - \gamma 3 = 100.020$
$\alpha 3 - \delta 3 = 54.655$
$\beta 3 - \gamma 3 = 110.930$
$\beta 3 - \delta 3 = 65.556$
$\gamma 3 - \delta 3 = -45.369$
$\alpha 3 + \beta 3 - 180 = 100.210$
$\gamma 3 + \delta 3 - 180 = -65.369$
$\alpha 3 + \gamma 3 - 180 = -10.714$
$\beta 3 + \delta 3 - 180 = 45.556$
$\alpha 3 + \delta 3 - 180 = 34.655$
$\beta 3 + \gamma 3 - 180 = 0.186$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = 165.580$

$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -56.270$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.469$

Vertex 4
$\alpha 4 - \beta 4 = 68.423$
$\alpha 4 - \gamma 4 = -31.076$
$\alpha 4 - \delta 4 = 12.951$
$\beta 4 - \gamma 4 = -99.499$
$\beta 4 - \delta 4 = -55.472$
$\gamma 4 - \delta 4 = 44.028$
$\alpha 4 + \beta 4 - 180 = -12.521$
$\gamma 4 + \delta 4 - 180 = 74.028$
$\alpha 4 + \gamma 4 - 180 = 86.979$
$\beta 4 + \delta 4 - 180 = -25.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = 18.556$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -86.548$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = 112.450$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 24.395$

Switch combination: Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 56.032$
$\alpha 1 - \gamma 1 = 131.840$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = 75.810$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = 71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = -60.292$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 169.600$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 17.981$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = 94.083$

Vertex 2
$\alpha 2 - \beta 2 = 114.700$
$\alpha 2 - \gamma 2 = 144.980$
$\alpha 2 - \delta 2 = 48.834$
$\beta 2 - \gamma 2 = 30.277$
$\beta 2 - \delta 2 = -65.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = 32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = 2.686$
$\beta 2 + \delta 2 - 180 = -15.871$
$\alpha 2 + \delta 2 - 180 = 98.834$
$\beta 2 + \gamma 2 - 180 = -112.020$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 79.110$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 18.557$

$\alpha2 + \delta2 - \beta2 - \gamma2 = 210.850$

Vertex 3

$\alpha3 - \beta3 = 100.210$
$\alpha3 - \gamma3 = -10.714$
$\alpha3 - \delta3 = 54.655$
$\beta3 - \gamma3 = -110.930$
$\beta3 - \delta3 = -45.556$
$\gamma3 - \delta3 = 65.369$
$\alpha3 + \beta3 - 180 = -10.900$
$\gamma3 + \delta3 - 180 = 45.369$
$\alpha3 + \gamma3 - 180 = 100.020$
$\beta3 + \delta3 - 180 = -65.556$
$\alpha3 + \delta3 - 180 = 34.655$
$\beta3 + \gamma3 - 180 = -0.186$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -56.270$
$\alpha3 + \gamma3 - \beta3 - \delta3 = 165.580$
$\alpha3 + \delta3 - \beta3 - \gamma3 = 34.841$

Vertex 4

$\alpha4 - \beta4 = 68.423$
$\alpha4 - \gamma4 = -31.076$
$\alpha4 - \delta4 = 12.951$
$\beta4 - \gamma4 = -99.499$
$\beta4 - \delta4 = -55.472$
$\gamma4 - \delta4 = 44.028$
$\alpha4 + \beta4 - 180 = -12.521$
$\gamma4 + \delta4 - 180 = 74.028$
$\alpha4 + \gamma4 - 180 = 86.979$
$\beta4 + \delta4 - 180 = -25.472$
$\alpha4 + \delta4 - 180 = 42.951$
$\beta4 + \gamma4 - 180 = 18.556$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -86.548$
$\alpha4 + \gamma4 - \beta4 - \delta4 = 112.450$
$\alpha4 + \delta4 - \beta4 - \gamma4 = 24.395$

Switch combination: Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1

$\alpha1 - \beta1 = -56.032$
$\alpha1 - \gamma1 = 4.260$
$\alpha1 - \delta1 = -33.791$
$\beta1 - \gamma1 = 60.292$
$\beta1 - \delta1 = 22.241$
$\gamma1 - \delta1 = -38.051$
$\alpha1 + \beta1 - 180 = -71.551$
$\gamma1 + \delta1 - 180 = -98.051$
$\alpha1 + \gamma1 - 180 = -131.840$
$\beta1 + \delta1 - 180 = -37.759$
$\alpha1 + \delta1 - 180 = -93.791$
$\beta1 + \gamma1 - 180 = -75.810$
$\alpha1 + \beta1 - \gamma1 - \delta1 = 26.500$
$\alpha1 + \gamma1 - \beta1 - \delta1 = -94.083$
$\alpha1 + \delta1 - \beta1 - \gamma1 = -17.981$

Vertex 2
$\alpha2 - \beta2 = -114.700$
$\alpha2 - \gamma2 = -2.686$
$\alpha2 - \delta2 = -98.834$
$\beta2 - \gamma2 = 112.020$
$\beta2 - \delta2 = 15.871$
$\gamma2 - \delta2 = -96.148$
$\alpha2 + \beta2 - 180 = -32.963$
$\gamma2 + \delta2 - 180 = -46.148$
$\alpha2 + \gamma2 - 180 = -144.980$
$\beta2 + \delta2 - 180 = 65.871$
$\alpha2 + \delta2 - 180 = -48.834$
$\beta2 + \gamma2 - 180 = -30.277$
$\alpha2 + \beta2 - \gamma2 - \delta2 = 13.185$
$\alpha2 + \gamma2 - \beta2 - \delta2 = -210.850$
$\alpha2 + \delta2 - \beta2 - \gamma2 = -18.557$

Vertex 3
$\alpha3 - \beta3 = -100.210$
$\alpha3 - \gamma3 = -100.020$
$\alpha3 - \delta3 = -34.655$
$\beta3 - \gamma3 = 0.186$
$\beta3 - \delta3 = 65.556$
$\gamma3 - \delta3 = 65.369$
$\alpha3 + \beta3 - 180 = 10.900$
$\gamma3 + \delta3 - 180 = 45.369$
$\alpha3 + \gamma3 - 180 = 10.714$
$\beta3 + \delta3 - 180 = 45.556$
$\alpha3 + \delta3 - 180 = -54.655$
$\beta3 + \gamma3 - 180 = 110.930$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -34.469$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -34.841$
$\alpha3 + \delta3 - \beta3 - \gamma3 = -165.580$

Vertex 4
$\alpha4 - \beta4 = -68.423$
$\alpha4 - \gamma4 = -86.979$
$\alpha4 - \delta4 = -42.951$
$\beta4 - \gamma4 = -18.556$
$\beta4 - \delta4 = 25.472$
$\gamma4 - \delta4 = 44.028$
$\alpha4 + \beta4 - 180 = 12.521$
$\gamma4 + \delta4 - 180 = 74.028$
$\alpha4 + \gamma4 - 180 = 31.076$
$\beta4 + \delta4 - 180 = 55.472$
$\alpha4 + \delta4 - 180 = -12.951$
$\beta4 + \gamma4 - 180 = 99.499$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -61.507$
$\alpha4 + \gamma4 - \beta4 - \delta4 = -24.395$
$\alpha4 + \delta4 - \beta4 - \gamma4 = -112.450$

Switch combination: Right + Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1

$\alpha 1 - \beta 1 = -71.551$

$\alpha 1 - \gamma 1 = -131.840$

$\alpha 1 - \delta 1 = -33.791$

$\beta 1 - \gamma 1 = -60.292$

$\beta 1 - \delta 1 = 37.759$

$\gamma 1 - \delta 1 = 98.051$

$\alpha 1 + \beta 1 - 180 = -56.032$

$\gamma 1 + \delta 1 - 180 = 38.051$

$\alpha 1 + \gamma 1 - 180 = 4.260$

$\beta 1 + \delta 1 - 180 = -22.241$

$\alpha 1 + \delta 1 - 180 = -93.791$

$\beta 1 + \gamma 1 - 180 = 75.810$

$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = -94.083$

$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 26.500$

$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -169.600$

Vertex 2

$\alpha 2 - \beta 2 = -32.963$

$\alpha 2 - \gamma 2 = -144.980$

$\alpha 2 - \delta 2 = -98.834$

$\beta 2 - \gamma 2 = -112.020$

$\beta 2 - \delta 2 = -65.871$

$\gamma 2 - \delta 2 = 46.148$

$\alpha 2 + \beta 2 - 180 = -114.700$

$\gamma 2 + \delta 2 - 180 = 96.148$

$\alpha 2 + \gamma 2 - 180 = -2.686$

$\beta 2 + \delta 2 - 180 = -15.871$

$\alpha 2 + \delta 2 - 180 = -48.834$

$\beta 2 + \gamma 2 - 180 = 30.277$

$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = -210.850$

$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 13.185$

$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -79.110$

Vertex 3

$\alpha 3 - \beta 3 = -10.900$

$\alpha 3 - \gamma 3 = 100.020$

$\alpha 3 - \delta 3 = 54.655$

$\beta 3 - \gamma 3 = 110.930$

$\beta 3 - \delta 3 = 65.556$

$\gamma 3 - \delta 3 = -45.369$

$\alpha 3 + \beta 3 - 180 = 100.210$

$\gamma 3 + \delta 3 - 180 = -65.369$

$\alpha 3 + \gamma 3 - 180 = -10.714$

$\beta 3 + \delta 3 - 180 = 45.556$

$\alpha 3 + \delta 3 - 180 = 34.655$

$\beta 3 + \gamma 3 - 180 = 0.186$

$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = 165.580$

$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -56.270$

$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.469$

Vertex 4

$\alpha 4 - \beta 4 = -12.521$

$\alpha 4 - \gamma 4 = 86.979$

$\alpha 4 - \delta 4 = 12.951$

$\beta 4 - \gamma 4 = 99.499$

$\beta 4 - \delta 4 = 25.472$

$\gamma 4 - \delta 4 = -74.028$

$\alpha 4 + \beta 4 - 180 = 68.423$

$\gamma 4 + \delta 4 - 180 = -44.028$

$\alpha 4 + \gamma 4 - 180 = -31.076$

$\beta 4 + \delta 4 - 180 = 55.472$

$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = -18.556$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = 112.450$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -86.548$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 61.507$

Switch combination: Right + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 71.551$
$\alpha 1 - \gamma 1 = -4.260$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = -75.810$
$\beta 1 - \delta 1 = 22.241$
$\gamma 1 - \delta 1 = 98.051$
$\alpha 1 + \beta 1 - 180 = 56.032$
$\gamma 1 + \delta 1 - 180 = 38.051$
$\alpha 1 + \gamma 1 - 180 = 131.840$
$\beta 1 + \delta 1 - 180 = -37.759$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = 60.292$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 17.981$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 169.600$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -26.500$

Vertex 2
$\alpha 2 - \beta 2 = 114.700$
$\alpha 2 - \gamma 2 = 144.980$
$\alpha 2 - \delta 2 = 48.834$
$\beta 2 - \gamma 2 = 30.277$
$\beta 2 - \delta 2 = -65.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = 32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = 2.686$
$\beta 2 + \delta 2 - 180 = -15.871$
$\alpha 2 + \delta 2 - 180 = 98.834$
$\beta 2 + \gamma 2 - 180 = -112.020$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 79.110$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 18.557$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = 210.850$

Vertex 3
$\alpha 3 - \beta 3 = 100.210$
$\alpha 3 - \gamma 3 = -10.714$
$\alpha 3 - \delta 3 = 54.655$
$\beta 3 - \gamma 3 = -110.930$
$\beta 3 - \delta 3 = -45.556$
$\gamma 3 - \delta 3 = 65.369$
$\alpha 3 + \beta 3 - 180 = -10.900$
$\gamma 3 + \delta 3 - 180 = 45.369$
$\alpha 3 + \gamma 3 - 180 = 100.020$
$\beta 3 + \delta 3 - 180 = -65.556$
$\alpha 3 + \delta 3 - 180 = 34.655$

$\alpha 3 + \delta 3 - 180 = -54.655$
$\beta 3 + \gamma 3 - 180 = -0.186$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -56.270$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = 165.580$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.841$

Vertex 4
$\alpha 4 - \beta 4 = -12.521$
$\alpha 4 - \gamma 4 = 86.979$
$\alpha 4 - \delta 4 = 12.951$
$\beta 4 - \gamma 4 = 99.499$
$\beta 4 - \delta 4 = 25.472$
$\gamma 4 - \delta 4 = -74.028$
$\alpha 4 + \beta 4 - 180 = 68.423$
$\gamma 4 + \delta 4 - 180 = -44.028$
$\alpha 4 + \gamma 4 - 180 = -31.076$
$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = -18.556$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = 112.450$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -86.548$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 61.507$

Switch combination: Right + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = -71.551$
$\alpha 1 - \gamma 1 = -131.840$
$\alpha 1 - \delta 1 = -33.791$
$\beta 1 - \gamma 1 = -60.292$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = 98.051$
$\alpha 1 + \beta 1 - 180 = -56.032$
$\gamma 1 + \delta 1 - 180 = 38.051$
$\alpha 1 + \gamma 1 - 180 = 4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = -93.791$
$\beta 1 + \gamma 1 - 180 = 75.810$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = -94.083$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 26.500$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -169.600$

Vertex 2
$\alpha 2 - \beta 2 = -114.700$
$\alpha 2 - \gamma 2 = -2.686$
$\alpha 2 - \delta 2 = -98.834$
$\beta 2 - \gamma 2 = 112.020$
$\beta 2 - \delta 2 = 15.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = -32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = -144.980$
$\beta 2 + \delta 2 - 180 = 65.871$
$\alpha 2 + \delta 2 - 180 = -48.834$
$\beta 2 + \gamma 2 - 180 = -30.277$

$\beta 2 + \gamma 2 - 180 = -30.277$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 13.185$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = -210.850$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -18.557$

Vertex 3
$\alpha 3 - \beta 3 = -100.210$
$\alpha 3 - \gamma 3 = -100.020$
$\alpha 3 - \delta 3 = -34.655$
$\beta 3 - \gamma 3 = 0.186$
$\beta 3 - \delta 3 = 65.556$
$\gamma 3 - \delta 3 = 65.369$
$\alpha 3 + \beta 3 - 180 = 10.900$
$\gamma 3 + \delta 3 - 180 = 45.369$
$\alpha 3 + \gamma 3 - 180 = 10.714$
$\beta 3 + \delta 3 - 180 = 45.556$
$\alpha 3 + \delta 3 - 180 = -54.655$
$\beta 3 + \gamma 3 - 180 = 110.930$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -34.469$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -34.841$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = -165.580$

Vertex 4
$\alpha 4 - \beta 4 = 12.521$
$\alpha 4 - \gamma 4 = 31.076$
$\alpha 4 - \delta 4 = -42.951$
$\beta 4 - \gamma 4 = 18.556$
$\beta 4 - \delta 4 = -55.472$
$\gamma 4 - \delta 4 = -74.028$
$\alpha 4 + \beta 4 - 180 = -68.423$
$\gamma 4 + \delta 4 - 180 = -44.028$
$\alpha 4 + \gamma 4 - 180 = -86.979$
$\beta 4 + \delta 4 - 180 = -25.472$
$\alpha 4 + \delta 4 - 180 = -12.951$
$\beta 4 + \gamma 4 - 180 = -99.499$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -24.395$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -61.507$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 86.548$

Switch combination: Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 56.032$
$\alpha 1 - \gamma 1 = 131.840$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = 75.810$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = 71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = -60.292$

$\alpha1 + \beta1 - \gamma1 - \delta1 = 169.600$
$\alpha1 + \gamma1 - \beta1 - \delta1 = 17.981$
$\alpha1 + \delta1 - \beta1 - \gamma1 = 94.083$

Vertex 2
$\alpha2 - \beta2 = 32.963$
$\alpha2 - \gamma2 = 2.686$
$\alpha2 - \delta2 = 48.834$
$\beta2 - \gamma2 = -30.277$
$\beta2 - \delta2 = 15.871$
$\gamma2 - \delta2 = 46.148$
$\alpha2 + \beta2 - 180 = 114.700$
$\gamma2 + \delta2 - 180 = 96.148$
$\alpha2 + \gamma2 - 180 = 144.980$
$\beta2 + \delta2 - 180 = 65.871$
$\alpha2 + \delta2 - 180 = 98.834$
$\beta2 + \gamma2 - 180 = 112.020$
$\alpha2 + \beta2 - \gamma2 - \delta2 = 18.557$
$\alpha2 + \gamma2 - \beta2 - \delta2 = 79.110$
$\alpha2 + \delta2 - \beta2 - \gamma2 = -13.185$

Vertex 3
$\alpha3 - \beta3 = -10.900$
$\alpha3 - \gamma3 = 100.020$
$\alpha3 - \delta3 = 54.655$
$\beta3 - \gamma3 = 110.930$
$\beta3 - \delta3 = 65.556$
$\gamma3 - \delta3 = -45.369$
$\alpha3 + \beta3 - 180 = 100.210$
$\gamma3 + \delta3 - 180 = -65.369$
$\alpha3 + \gamma3 - 180 = -10.714$
$\beta3 + \delta3 - 180 = 45.556$
$\alpha3 + \delta3 - 180 = 34.655$
$\beta3 + \gamma3 - 180 = 0.186$
$\alpha3 + \beta3 - \gamma3 - \delta3 = 165.580$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -56.270$
$\alpha3 + \delta3 - \beta3 - \gamma3 = 34.469$

Vertex 4
$\alpha4 - \beta4 = 68.423$
$\alpha4 - \gamma4 = -31.076$
$\alpha4 - \delta4 = 12.951$
$\beta4 - \gamma4 = -99.499$
$\beta4 - \delta4 = -55.472$
$\gamma4 - \delta4 = 44.028$
$\alpha4 + \beta4 - 180 = -12.521$
$\gamma4 + \delta4 - 180 = 74.028$
$\alpha4 + \gamma4 - 180 = 86.979$
$\beta4 + \delta4 - 180 = -25.472$
$\alpha4 + \delta4 - 180 = 42.951$
$\beta4 + \gamma4 - 180 = 18.556$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -86.548$
$\alpha4 + \gamma4 - \beta4 - \delta4 = 112.450$
$\alpha4 + \delta4 - \beta4 - \gamma4 = 24.395$

Switch combination: Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1

$\alpha 1 - \beta 1 = -56.032$
$\alpha 1 - \gamma 1 = 4.260$
$\alpha 1 - \delta 1 = -33.791$
$\beta 1 - \gamma 1 = 60.292$
$\beta 1 - \delta 1 = 22.241$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = -71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -131.840$
$\beta 1 + \delta 1 - 180 = -37.759$
$\alpha 1 + \delta 1 - 180 = -93.791$
$\beta 1 + \gamma 1 - 180 = -75.810$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 26.500$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = -94.083$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -17.981$

Vertex 2

$\alpha 2 - \beta 2 = -32.963$
$\alpha 2 - \gamma 2 = -144.980$
$\alpha 2 - \delta 2 = -98.834$
$\beta 2 - \gamma 2 = -112.020$
$\beta 2 - \delta 2 = -65.871$
$\gamma 2 - \delta 2 = 46.148$
$\alpha 2 + \beta 2 - 180 = -114.700$
$\gamma 2 + \delta 2 - 180 = 96.148$
$\alpha 2 + \gamma 2 - 180 = -2.686$
$\beta 2 + \delta 2 - 180 = -15.871$
$\alpha 2 + \delta 2 - 180 = -48.834$
$\beta 2 + \gamma 2 - 180 = 30.277$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = -210.850$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 13.185$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -79.110$

Vertex 3

$\alpha 3 - \beta 3 = 10.900$
$\alpha 3 - \gamma 3 = 10.714$
$\alpha 3 - \delta 3 = -34.655$
$\beta 3 - \gamma 3 = -0.186$
$\beta 3 - \delta 3 = -45.556$
$\gamma 3 - \delta 3 = -45.369$
$\alpha 3 + \beta 3 - 180 = -100.210$
$\gamma 3 + \delta 3 - 180 = -65.369$
$\alpha 3 + \gamma 3 - 180 = -100.020$
$\beta 3 + \delta 3 - 180 = -65.556$
$\alpha 3 + \delta 3 - 180 = -54.655$
$\beta 3 + \gamma 3 - 180 = -110.930$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -34.841$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -34.469$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 56.270$

Vertex 4

$\alpha 4 - \beta 4 = -68.423$
$\alpha 4 - \gamma 4 = -86.979$
$\alpha 4 - \delta 4 = -42.951$
$\beta 4 - \gamma 4 = -18.556$

$\beta 4 - \gamma 4 = -18.556$
$\beta 4 - \delta 4 = 25.472$
$\gamma 4 - \delta 4 = 44.028$
$\alpha 4 + \beta 4 - 180 = 12.521$
$\gamma 4 + \delta 4 - 180 = 74.028$
$\alpha 4 + \gamma 4 - 180 = 31.076$
$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = -12.951$
$\beta 4 + \gamma 4 - 180 = 99.499$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -61.507$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -24.395$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = -112.450$

Switch combination: Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 56.032$
$\alpha 1 - \gamma 1 = 131.840$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = 75.810$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = 71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = -60.292$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 169.600$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 17.981$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = 94.083$

Vertex 2
$\alpha 2 - \beta 2 = 114.700$
$\alpha 2 - \gamma 2 = 144.980$
$\alpha 2 - \delta 2 = 48.834$
$\beta 2 - \gamma 2 = 30.277$
$\beta 2 - \delta 2 = -65.871$
$\gamma 2 - \delta 2 = -96.148$
$\alpha 2 + \beta 2 - 180 = 32.963$
$\gamma 2 + \delta 2 - 180 = -46.148$
$\alpha 2 + \gamma 2 - 180 = 2.686$
$\beta 2 + \delta 2 - 180 = -15.871$
$\alpha 2 + \delta 2 - 180 = 98.834$
$\beta 2 + \gamma 2 - 180 = -112.020$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 79.110$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 18.557$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = 210.850$

Vertex 3
$\alpha 3 - \beta 3 = -100.210$
$\alpha 3 - \gamma 3 = -100.020$
$\alpha 3 - \delta 3 = -34.655$
$\beta 3 - \gamma 3 = 0.186$
$\beta 3 - \delta 3 = 65.556$

$\beta 3 - \delta 3 = 65.556$
$\gamma 3 - \delta 3 = 65.369$
$\alpha 3 + \beta 3 - 180 = 10.900$
$\gamma 3 + \delta 3 - 180 = 45.369$
$\alpha 3 + \gamma 3 - 180 = 10.714$
$\beta 3 + \delta 3 - 180 = 45.556$
$\alpha 3 + \delta 3 - 180 = -54.655$
$\beta 3 + \gamma 3 - 180 = 110.930$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = -34.469$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -34.841$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = -165.580$

Vertex 4
$\alpha 4 - \beta 4 = -68.423$
$\alpha 4 - \gamma 4 = -86.979$
$\alpha 4 - \delta 4 = -42.951$
$\beta 4 - \gamma 4 = -18.556$
$\beta 4 - \delta 4 = 25.472$
$\gamma 4 - \delta 4 = 44.028$
$\alpha 4 + \beta 4 - 180 = 12.521$
$\gamma 4 + \delta 4 - 180 = 74.028$
$\alpha 4 + \gamma 4 - 180 = 31.076$
$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = -12.951$
$\beta 4 + \gamma 4 - 180 = 99.499$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -61.507$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -24.395$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = -112.450$

Switch combination: Right + Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 71.551$
$\alpha 1 - \gamma 1 = -4.260$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = -75.810$
$\beta 1 - \delta 1 = 22.241$
$\gamma 1 - \delta 1 = 98.051$
$\alpha 1 + \beta 1 - 180 = 56.032$
$\gamma 1 + \delta 1 - 180 = 38.051$
$\alpha 1 + \gamma 1 - 180 = 131.840$
$\beta 1 + \delta 1 - 180 = -37.759$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = 60.292$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 17.981$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 169.600$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = -26.500$

Vertex 2
$\alpha 2 - \beta 2 = 32.963$
$\alpha 2 - \gamma 2 = 2.686$
$\alpha 2 - \delta 2 = 48.834$
$\beta 2 - \gamma 2 = -30.277$
$\beta 2 - \delta 2 = 15.871$
$\gamma 2 - \delta 2 = 46.148$

$\gamma 2 - \delta 2 = 46.148$
$\alpha 2 + \beta 2 - 180 = 114.700$
$\gamma 2 + \delta 2 - 180 = 96.148$
$\alpha 2 + \gamma 2 - 180 = 144.980$
$\beta 2 + \delta 2 - 180 = 65.871$
$\alpha 2 + \delta 2 - 180 = 98.834$
$\beta 2 + \gamma 2 - 180 = 112.020$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 18.557$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 79.110$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -13.185$

Vertex 3
$\alpha 3 - \beta 3 = -10.900$
$\alpha 3 - \gamma 3 = 100.020$
$\alpha 3 - \delta 3 = 54.655$
$\beta 3 - \gamma 3 = 110.930$
$\beta 3 - \delta 3 = 65.556$
$\gamma 3 - \delta 3 = -45.369$
$\alpha 3 + \beta 3 - 180 = 100.210$
$\gamma 3 + \delta 3 - 180 = -65.369$
$\alpha 3 + \gamma 3 - 180 = -10.714$
$\beta 3 + \delta 3 - 180 = 45.556$
$\alpha 3 + \delta 3 - 180 = 34.655$
$\beta 3 + \gamma 3 - 180 = 0.186$
$\alpha 3 + \beta 3 - \gamma 3 - \delta 3 = 165.580$
$\alpha 3 + \gamma 3 - \beta 3 - \delta 3 = -56.270$
$\alpha 3 + \delta 3 - \beta 3 - \gamma 3 = 34.469$

Vertex 4
$\alpha 4 - \beta 4 = -12.521$
$\alpha 4 - \gamma 4 = 86.979$
$\alpha 4 - \delta 4 = 12.951$
$\beta 4 - \gamma 4 = 99.499$
$\beta 4 - \delta 4 = 25.472$
$\gamma 4 - \delta 4 = -74.028$
$\alpha 4 + \beta 4 - 180 = 68.423$
$\gamma 4 + \delta 4 - 180 = -44.028$
$\alpha 4 + \gamma 4 - 180 = -31.076$
$\beta 4 + \delta 4 - 180 = 55.472$
$\alpha 4 + \delta 4 - 180 = 42.951$
$\beta 4 + \gamma 4 - 180 = -18.556$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = 112.450$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -86.548$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 61.507$

Switch combination: Right + Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = -71.551$
$\alpha 1 - \gamma 1 = -131.840$
$\alpha 1 - \delta 1 = -33.791$
$\beta 1 - \gamma 1 = -60.292$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = 98.051$

$\alpha1 + \beta1 - 180 = -56.032$
$\gamma1 + \delta1 - 180 = 38.051$
$\alpha1 + \gamma1 - 180 = 4.260$
$\beta1 + \delta1 - 180 = -22.241$
$\alpha1 + \delta1 - 180 = -93.791$
$\beta1 + \gamma1 - 180 = 75.810$
$\alpha1 + \beta1 - \gamma1 - \delta1 = -94.083$
$\alpha1 + \gamma1 - \beta1 - \delta1 = 26.500$
$\alpha1 + \delta1 - \beta1 - \gamma1 = -169.600$

Vertex 2
$\alpha2 - \beta2 = -32.963$
$\alpha2 - \gamma2 = -144.980$
$\alpha2 - \delta2 = -98.834$
$\beta2 - \gamma2 = -112.020$
$\beta2 - \delta2 = -65.871$
$\gamma2 - \delta2 = 46.148$
$\alpha2 + \beta2 - 180 = -114.700$
$\gamma2 + \delta2 - 180 = 96.148$
$\alpha2 + \gamma2 - 180 = -2.686$
$\beta2 + \delta2 - 180 = -15.871$
$\alpha2 + \delta2 - 180 = -48.834$
$\beta2 + \gamma2 - 180 = 30.277$
$\alpha2 + \beta2 - \gamma2 - \delta2 = -210.850$
$\alpha2 + \gamma2 - \beta2 - \delta2 = 13.185$
$\alpha2 + \delta2 - \beta2 - \gamma2 = -79.110$

Vertex 3
$\alpha3 - \beta3 = 10.900$
$\alpha3 - \gamma3 = 10.714$
$\alpha3 - \delta3 = -34.655$
$\beta3 - \gamma3 = -0.186$
$\beta3 - \delta3 = -45.556$
$\gamma3 - \delta3 = -45.369$
$\alpha3 + \beta3 - 180 = -100.210$
$\gamma3 + \delta3 - 180 = -65.369$
$\alpha3 + \gamma3 - 180 = -100.020$
$\beta3 + \delta3 - 180 = -65.556$
$\alpha3 + \delta3 - 180 = -54.655$
$\beta3 + \gamma3 - 180 = -110.930$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -34.841$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -34.469$
$\alpha3 + \delta3 - \beta3 - \gamma3 = 56.270$

Vertex 4
$\alpha4 - \beta4 = 12.521$
$\alpha4 - \gamma4 = 31.076$
$\alpha4 - \delta4 = -42.951$
$\beta4 - \gamma4 = 18.556$
$\beta4 - \delta4 = -55.472$
$\gamma4 - \delta4 = -74.028$
$\alpha4 + \beta4 - 180 = -68.423$
$\gamma4 + \delta4 - 180 = -44.028$
$\alpha4 + \gamma4 - 180 = -86.979$
$\beta4 + \delta4 - 180 = -25.472$
$\alpha4 + \delta4 - 180 = -12.951$
$\beta4 + \gamma4 - 180 = -99.499$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -24.395$
$\alpha4 + \gamma4 - \beta4 - \delta4 = -61.507$
$\alpha4 + \delta4 - \beta4 - \gamma4 = 86.548$

Switch combination: Right + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha1 - \beta1 = 71.551$
$\alpha1 - \gamma1 = -4.260$
$\alpha1 - \delta1 = 93.791$
$\beta1 - \gamma1 = -75.810$
$\beta1 - \delta1 = 22.241$
$\gamma1 - \delta1 = 98.051$
$\alpha1 + \beta1 - 180 = 56.032$
$\gamma1 + \delta1 - 180 = 38.051$
$\alpha1 + \gamma1 - 180 = 131.840$
$\beta1 + \delta1 - 180 = -37.759$
$\alpha1 + \delta1 - 180 = 33.791$
$\beta1 + \gamma1 - 180 = 60.292$
$\alpha1 + \beta1 - \gamma1 - \delta1 = 17.981$
$\alpha1 + \gamma1 - \beta1 - \delta1 = 169.600$
$\alpha1 + \delta1 - \beta1 - \gamma1 = -26.500$

Vertex 2
$\alpha2 - \beta2 = 114.700$
$\alpha2 - \gamma2 = 144.980$
$\alpha2 - \delta2 = 48.834$
$\beta2 - \gamma2 = 30.277$
$\beta2 - \delta2 = -65.871$
$\gamma2 - \delta2 = -96.148$
$\alpha2 + \beta2 - 180 = 32.963$
$\gamma2 + \delta2 - 180 = -46.148$
$\alpha2 + \gamma2 - 180 = 2.686$
$\beta2 + \delta2 - 180 = -15.871$
$\alpha2 + \delta2 - 180 = 98.834$
$\beta2 + \gamma2 - 180 = -112.020$
$\alpha2 + \beta2 - \gamma2 - \delta2 = 79.110$
$\alpha2 + \gamma2 - \beta2 - \delta2 = 18.557$
$\alpha2 + \delta2 - \beta2 - \gamma2 = 210.850$

Vertex 3
$\alpha3 - \beta3 = -100.210$
$\alpha3 - \gamma3 = -100.020$
$\alpha3 - \delta3 = -34.655$
$\beta3 - \gamma3 = 0.186$
$\beta3 - \delta3 = 65.556$
$\gamma3 - \delta3 = 65.369$
$\alpha3 + \beta3 - 180 = 10.900$
$\gamma3 + \delta3 - 180 = 45.369$
$\alpha3 + \gamma3 - 180 = 10.714$
$\beta3 + \delta3 - 180 = 45.556$
$\alpha3 + \delta3 - 180 = -54.655$
$\beta3 + \gamma3 - 180 = 110.930$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -34.469$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -34.841$
$\alpha3 + \delta3 - \beta3 - \gamma3 = -165.580$

Vertex 4
$\alpha 4 - \beta 4 = 12.521$
$\alpha 4 - \gamma 4 = 31.076$
$\alpha 4 - \delta 4 = -42.951$
$\beta 4 - \gamma 4 = 18.556$
$\beta 4 - \delta 4 = -55.472$
$\gamma 4 - \delta 4 = -74.028$
$\alpha 4 + \beta 4 - 180 = -68.423$
$\gamma 4 + \delta 4 - 180 = -44.028$
$\alpha 4 + \gamma 4 - 180 = -86.979$
$\beta 4 + \delta 4 - 180 = -25.472$
$\alpha 4 + \delta 4 - 180 = -12.951$
$\beta 4 + \gamma 4 - 180 = -99.499$
$\alpha 4 + \beta 4 - \gamma 4 - \delta 4 = -24.395$
$\alpha 4 + \gamma 4 - \beta 4 - \delta 4 = -61.507$
$\alpha 4 + \delta 4 - \beta 4 - \gamma 4 = 86.548$

Switch combination: Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha 1 - \beta 1 = 56.032$
$\alpha 1 - \gamma 1 = 131.840$
$\alpha 1 - \delta 1 = 93.791$
$\beta 1 - \gamma 1 = 75.810$
$\beta 1 - \delta 1 = 37.759$
$\gamma 1 - \delta 1 = -38.051$
$\alpha 1 + \beta 1 - 180 = 71.551$
$\gamma 1 + \delta 1 - 180 = -98.051$
$\alpha 1 + \gamma 1 - 180 = -4.260$
$\beta 1 + \delta 1 - 180 = -22.241$
$\alpha 1 + \delta 1 - 180 = 33.791$
$\beta 1 + \gamma 1 - 180 = -60.292$
$\alpha 1 + \beta 1 - \gamma 1 - \delta 1 = 169.600$
$\alpha 1 + \gamma 1 - \beta 1 - \delta 1 = 17.981$
$\alpha 1 + \delta 1 - \beta 1 - \gamma 1 = 94.083$

Vertex 2
$\alpha 2 - \beta 2 = 32.963$
$\alpha 2 - \gamma 2 = 2.686$
$\alpha 2 - \delta 2 = 48.834$
$\beta 2 - \gamma 2 = -30.277$
$\beta 2 - \delta 2 = 15.871$
$\gamma 2 - \delta 2 = 46.148$
$\alpha 2 + \beta 2 - 180 = 114.700$
$\gamma 2 + \delta 2 - 180 = 96.148$
$\alpha 2 + \gamma 2 - 180 = 144.980$
$\beta 2 + \delta 2 - 180 = 65.871$
$\alpha 2 + \delta 2 - 180 = 98.834$
$\beta 2 + \gamma 2 - 180 = 112.020$
$\alpha 2 + \beta 2 - \gamma 2 - \delta 2 = 18.557$
$\alpha 2 + \gamma 2 - \beta 2 - \delta 2 = 79.110$
$\alpha 2 + \delta 2 - \beta 2 - \gamma 2 = -13.185$

Vertex 3

$\alpha3 - \beta3 = 10.900$
$\alpha3 - \gamma3 = 10.714$
$\alpha3 - \delta3 = -34.655$
$\beta3 - \gamma3 = -0.186$
$\beta3 - \delta3 = -45.556$
$\gamma3 - \delta3 = -45.369$
$\alpha3 + \beta3 - 180 = -100.210$
$\gamma3 + \delta3 - 180 = -65.369$
$\alpha3 + \gamma3 - 180 = -100.020$
$\beta3 + \delta3 - 180 = -65.556$
$\alpha3 + \delta3 - 180 = -54.655$
$\beta3 + \gamma3 - 180 = -110.930$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -34.841$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -34.469$
$\alpha3 + \delta3 - \beta3 - \gamma3 = 56.270$

Vertex 4
$\alpha4 - \beta4 = -68.423$
$\alpha4 - \gamma4 = -86.979$
$\alpha4 - \delta4 = -42.951$
$\beta4 - \gamma4 = -18.556$
$\beta4 - \delta4 = 25.472$
$\gamma4 - \delta4 = 44.028$
$\alpha4 + \beta4 - 180 = 12.521$
$\gamma4 + \delta4 - 180 = 74.028$
$\alpha4 + \gamma4 - 180 = 31.076$
$\beta4 + \delta4 - 180 = 55.472$
$\alpha4 + \delta4 - 180 = -12.951$
$\beta4 + \gamma4 - 180 = 99.499$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -61.507$
$\alpha4 + \gamma4 - \beta4 - \delta4 = -24.395$
$\alpha4 + \delta4 - \beta4 - \gamma4 = -112.450$

Switch combination: Right + Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

Angle relation checks for i = 1..4:

Vertex 1
$\alpha1 - \beta1 = 71.551$
$\alpha1 - \gamma1 = -4.260$
$\alpha1 - \delta1 = 93.791$
$\beta1 - \gamma1 = -75.810$
$\beta1 - \delta1 = 22.241$
$\gamma1 - \delta1 = 98.051$
$\alpha1 + \beta1 - 180 = 56.032$
$\gamma1 + \delta1 - 180 = 38.051$
$\alpha1 + \gamma1 - 180 = 131.840$
$\beta1 + \delta1 - 180 = -37.759$
$\alpha1 + \delta1 - 180 = 33.791$
$\beta1 + \gamma1 - 180 = 60.292$
$\alpha1 + \beta1 - \gamma1 - \delta1 = 17.981$
$\alpha1 + \gamma1 - \beta1 - \delta1 = 169.600$
$\alpha1 + \delta1 - \beta1 - \gamma1 = -26.500$

Vertex 2
$\alpha2 - \beta2 = 32.963$

$\alpha2 - \gamma2 = 2.686$
$\alpha2 - \delta2 = 48.834$
$\beta2 - \gamma2 = -30.277$
$\beta2 - \delta2 = 15.871$
$\gamma2 - \delta2 = 46.148$
$\alpha2 + \beta2 - 180 = 114.700$
$\gamma2 + \delta2 - 180 = 96.148$
$\alpha2 + \gamma2 - 180 = 144.980$
$\beta2 + \delta2 - 180 = 65.871$
$\alpha2 + \delta2 - 180 = 98.834$
$\beta2 + \gamma2 - 180 = 112.020$
$\alpha2 + \beta2 - \gamma2 - \delta2 = 18.557$
$\alpha2 + \gamma2 - \beta2 - \delta2 = 79.110$
$\alpha2 + \delta2 - \beta2 - \gamma2 = -13.185$

Vertex 3
$\alpha3 - \beta3 = 10.900$
$\alpha3 - \gamma3 = 10.714$
$\alpha3 - \delta3 = -34.655$
$\beta3 - \gamma3 = -0.186$
$\beta3 - \delta3 = -45.556$
$\gamma3 - \delta3 = -45.369$
$\alpha3 + \beta3 - 180 = -100.210$
$\gamma3 + \delta3 - 180 = -65.369$
$\alpha3 + \gamma3 - 180 = -100.020$
$\beta3 + \delta3 - 180 = -65.556$
$\alpha3 + \delta3 - 180 = -54.655$
$\beta3 + \gamma3 - 180 = -110.930$
$\alpha3 + \beta3 - \gamma3 - \delta3 = -34.841$
$\alpha3 + \gamma3 - \beta3 - \delta3 = -34.469$
$\alpha3 + \delta3 - \beta3 - \gamma3 = 56.270$

Vertex 4
$\alpha4 - \beta4 = 12.521$
$\alpha4 - \gamma4 = 31.076$
$\alpha4 - \delta4 = -42.951$
$\beta4 - \gamma4 = 18.556$
$\beta4 - \delta4 = -55.472$
$\gamma4 - \delta4 = -74.028$
$\alpha4 + \beta4 - 180 = -68.423$
$\gamma4 + \delta4 - 180 = -44.028$
$\alpha4 + \gamma4 - 180 = -86.979$
$\beta4 + \delta4 - 180 = -25.472$
$\alpha4 + \delta4 - 180 = -12.951$
$\beta4 + \gamma4 - 180 = -99.499$
$\alpha4 + \beta4 - \gamma4 - \delta4 = -24.395$
$\alpha4 + \gamma4 - \beta4 - \delta4 = -61.507$
$\alpha4 + \delta4 - \beta4 - \gamma4 = 86.548$

Out[1582]=

================= NOT CONJUGATE-MODULAR =================

$M1 = M2 = M3 = M4 = M$ and $M \neq 2 \Rightarrow$ NOT conjugate-modular. Boundary-strip switches preserve this.

Initial configuration (no switches applied):

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Left

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 134.655 & 34.4444 & 145.369 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 130.871 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 49.5283 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 82.2408 & 21.9491 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Left + Lower

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 134.655 & 145.556 & 34.6305 & 80 \\ 117.951 & 130.472 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Left + Upper

Switched anglesDeg:

$$\begin{pmatrix} 26.2086 & 97.7592 & 158.051 & 60 \\ 16.1662 & 49.129 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 49.129 & 18.8525 & 115 \\ 45.3447 & 145.556 & 145.369 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 97.7592 & 21.9491 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 130.472 & 149.028 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Switch combination: Right + Left + Lower + Upper

Switched anglesDeg:

$$\begin{pmatrix} 153.791 & 82.2408 & 158.051 & 60 \\ 163.834 & 130.871 & 161.148 & 115 \\ 45.3447 & 34.4444 & 34.6305 & 80 \\ 62.0488 & 49.5283 & 30.9725 & 105 \end{pmatrix}$$

M_i values:
M1 = 1.22593, M2 = 1.22593, M3 = 1.22593, M4 = 1.22593
M1 = M2 = M3 = M4 = M and M ≠ 2

Out[1586]=

================== NOT CHIMERA ==================

Fails conic, orthodiagonal & isogonal tests for all i=1, ..., 4 ⇒ NOT chimera. Boundary-strip switches preserve these failures as demonstrated in the NOT CONIC, NOT ORTHODIAGONAL, and NOT ISOGONAL sections.