DATA FILE: -

This file contains the data for each test fields. They can be also viewed on the command line in MATLAB after the code is successfully executed for the respective test field.

On running for test field 1:

Choose a test field by selecting number between 1 and 4:1

Trying Test Field 1

Displaying simplified vector field topology of test field 1

Critical point search:

==========

Guesses of critical points (20)

Revising

==========

(-1.0000,-0.9744) -> diff. from minimum = 0.0000: Accepted

(-1.0000,0.9744) -> diff. from minimum = 0.0000: Accepted

(1.0000,-0.9744) -> diff. from minimum = 0.0000: Accepted

(1.0000,0.9744) -> diff. from minimum = 0.0000: Accepted

(-1.0000,-1.0769) -> diff. from minimum = 0.0459: Rejected

(-1.0000,1.0769) -> diff. from minimum = 0.0459: Rejected

(1.0000,-1.0769) -> diff. from minimum = 0.0459: Rejected

(1.0000,1.0769) -> diff. from minimum = 0.0459: Rejected

(-1.0000,-0.8718) -> diff. from minimum = 0.1100: Rejected

(-1.0000,0.8718) -> diff. from minimum = 0.1100: Rejected

(1.0000,-0.8718) -> diff. from minimum = 0.1100: Rejected

(1.0000,0.8718) -> diff. from minimum = 0.1100: Rejected

(-0.8462,-0.9744) -> diff. from minimum = 0.1613: Rejected

(-0.8462,0.9744) -> diff. from minimum = 0.1613: Rejected

(0.8462,-0.9744) -> diff. from minimum = 0.1613: Rejected

(0.8462,0.9744) -> diff. from minimum = 0.1613: Rejected

(-0.8462,-1.0769) -> diff. from minimum = 0.2073: Rejected

(-0.8462,1.0769) -> diff. from minimum = 0.2073: Rejected

(0.8462,-1.0769) -> diff. from minimum = 0.2073: Rejected

(0.8462,1.0769) -> diff. from minimum = 0.2073: Rejected

Revised no. of critical points = 4

(-1.0000 -0.9744)

(-1.0000 0.9744)

(1.0000 -0.9744)

(1.0000 0.9744)

==========

Simplification of critical point 1 (-1.000,-0.974)

NR converged at iteration = 3

Refined root: (-1.0000, -0.9990)

Simplification of critical point 2 (-1.000,0.974)

NR converged at iteration = 3

Refined root: (-1.0000, 0.9990)

Simplification of critical point 3 (1.000,-0.974)

NR converged at iteration = 3

Refined root: (1.0000, -0.9990)

Simplification of critical point 4 (1.000,0.974)

NR converged at iteration = 3

Refined root: (1.0000, 0.9990)

Final no. of critical points found = 4

On running for test field 2:

Choose a test field by selecting number between 1 and 4:2

Trying Test Field 2

Displaying simplified vector field topology of test field 2

Critical point search:

==========

Guesses of critical points (20)

Revising

==========

(-0.0769,-0.0513) -> diff. from minimum = 0.0000: Accepted

(-0.0769,0.0513) -> diff. from minimum = 0.0000: Accepted

(0.0769,-0.0513) -> diff. from minimum = 0.0000: Accepted

(0.0769,0.0513) -> diff. from minimum = 0.0000: Accepted

(-0.2308,-0.1538) -> diff. from minimum = 0.0013: Accepted

(-0.2308,0.1538) -> diff. from minimum = 0.0013: Accepted

(0.2308,-0.1538) -> diff. from minimum = 0.0013: Accepted

(0.2308,0.1538) -> diff. from minimum = 0.0013: Accepted

(-0.8462,-0.8718) -> diff. from minimum = 0.0029: Accepted

(-0.8462,0.8718) -> diff. from minimum = 0.0029: Accepted

(0.8462,-0.8718) -> diff. from minimum = 0.0029: Accepted

(0.8462,0.8718) -> diff. from minimum = 0.0029: Accepted

(-0.2308,-0.0513) -> diff. from minimum = 0.0046: Accepted

(-0.2308,0.0513) -> diff. from minimum = 0.0046: Accepted

(0.2308,-0.0513) -> diff. from minimum = 0.0046: Accepted

(0.2308,0.0513) -> diff. from minimum = 0.0046: Accepted

(-0.0769,-0.1538) -> diff. from minimum = 0.0050: Accepted

(-0.0769,0.1538) -> diff. from minimum = 0.0050: Accepted

(0.0769,-0.1538) -> diff. from minimum = 0.0050: Accepted

(0.0769,0.1538) -> diff. from minimum = 0.0050: Accepted

Revised no. of critical points = 20

(-0.0769 -0.0513)

(-0.0769 0.0513)

(0.0769 -0.0513)

(0.0769 0.0513)

(-0.2308 -0.1538)

(-0.2308 0.1538)

(0.2308 -0.1538)

(0.2308 0.1538)

(-0.8462 -0.8718)

(-0.8462 0.8718)

(0.8462 -0.8718)

(0.8462 0.8718)

(-0.2308 -0.0513)

(-0.2308 0.0513)

(0.2308 -0.0513)

(0.2308 0.0513)

(-0.0769 -0.1538)

(-0.0769 0.1538)

(0.0769 -0.1538)

(0.0769 0.1538)

==========

Simplification of critical point 1 (-0.077,-0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (-0.0769, -0.0513)

Simplification of critical point 2 (-0.077,0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1026

Refined root: (-0.0769, -0.0513)

Simplification of critical point 3 (0.077,-0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1538

Refined root: (-0.0769, -0.0513)

Simplification of critical point 4 (0.077,0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1849

Refined root: (-0.0769, -0.0513)

Simplification of critical point 5 (-0.231,-0.154)

Duplicate found. Separation = 0.1281

Refined root: (-0.0769, -0.0513)

Simplification of critical point 6 (-0.231,0.154)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.2564

Refined root: (-0.0769, -0.0513)

Simplification of critical point 7 (0.231,-0.154)

Duplicate found. Separation = 0.1468

Refined root: (-0.0769, -0.0513)

Simplification of critical point 8 (0.231,0.154)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (0.2308, 0.1538)

Simplification of critical point 9 (-0.846,-0.872)

NR converged at iteration = 4

Refined root: (-0.8545, -0.8543)

Simplification of critical point 10 (-0.846,0.872)

NR converged at iteration = 4

Refined root: (-0.8545, 0.8543)

Simplification of critical point 11 (0.846,-0.872)

NR converged at iteration = 4

Refined root: (0.8545, -0.8543)

Simplification of critical point 12 (0.846,0.872)

NR converged at iteration = 4

Refined root: (0.8545, 0.8543)

Simplification of critical point 13 (-0.231,-0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1538

Refined root: (0.8545, 0.8543)

Simplification of critical point 14 (-0.231,0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1849

Refined root: (0.8545, 0.8543)

Simplification of critical point 15 (0.231,-0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.2051

Refined root: (0.8545, 0.8543)

Simplification of critical point 16 (0.231,0.051)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1026

Refined root: (0.8545, 0.8543)

Simplification of critical point 17 (-0.077,-0.154)

NR converged at iteration = 71

Duplicate found. Separation = 0.0000

Refined root: (0.8545, 0.8543)

Simplification of critical point 18 (-0.077,0.154)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.2051

Refined root: (0.8545, 0.8543)

Simplification of critical point 19 (0.077,-0.154)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1849

Refined root: (0.8545, 0.8543)

Simplification of critical point 20 (0.077,0.154)

Singular matrix found while performing iterations in Newton-Raphson.

Duplicate found. Separation = 0.1538

Refined root: (0.8545, 0.8543)

Final no. of critical points found = 6

Finished calculating integral lines for critical point 1

Finished calculating integral lines for critical point 2

Finished calculating integral lines for critical point 3

Finished calculating integral lines for critical point 4

Finished calculating integral lines for critical point 5

Finished calculating integral lines for critical point 6

On running for test field 3:

Choose a test field by selecting number between 1 and 4:3

Trying Test Field 3

Displaying simplified vector field topology of test field 3

Critical point search:

==========

Guesses of critical points (20)

Revising

==========

(-1.0000,-0.9744) -> diff. from minimum = 0.0000: Accepted

(-1.0000,0.9744) -> diff. from minimum = 0.0000: Accepted

(1.0000,-0.9744) -> diff. from minimum = 0.0000: Accepted

(1.0000,0.9744) -> diff. from minimum = 0.0000: Accepted

(-1.3077,-0.5641) -> diff. from minimum = 0.0105: Accepted

(-1.3077,0.5641) -> diff. from minimum = 0.0105: Accepted

(1.3077,-0.5641) -> diff. from minimum = 0.0105: Accepted

(1.3077,0.5641) -> diff. from minimum = 0.0105: Accepted

(-1.1538,-0.8718) -> diff. from minimum = 0.0148: Accepted

(-1.1538,0.8718) -> diff. from minimum = 0.0148: Accepted

(1.1538,-0.8718) -> diff. from minimum = 0.0148: Accepted

(1.1538,0.8718) -> diff. from minimum = 0.0148: Accepted

(-1.3077,-0.6667) -> diff. from minimum = 0.0188: Accepted

(-1.3077,0.6667) -> diff. from minimum = 0.0188: Accepted

(1.3077,-0.6667) -> diff. from minimum = 0.0188: Accepted

(1.3077,0.6667) -> diff. from minimum = 0.0188: Accepted

(-1.0000,-1.0769) -> diff. from minimum = 0.0459: Rejected

(-1.0000,1.0769) -> diff. from minimum = 0.0459: Rejected

(1.0000,-1.0769) -> diff. from minimum = 0.0459: Rejected

(1.0000,1.0769) -> diff. from minimum = 0.0459: Rejected

Revised no. of critical points = 16

(-1.0000 -0.9744)

(-1.0000 0.9744)

(1.0000 -0.9744)

(1.0000 0.9744)

(-1.3077 -0.5641)

(-1.3077 0.5641)

(1.3077 -0.5641)

(1.3077 0.5641)

(-1.1538 -0.8718)

(-1.1538 0.8718)

(1.1538 -0.8718)

(1.1538 0.8718)

(-1.3077 -0.6667)

(-1.3077 0.6667)

(1.3077 -0.6667)

(1.3077 0.6667)

==========

Simplification of critical point 1 (-1.000,-0.974)

NR converged at iteration = 3

Refined root: (-1.0000, -0.9990)

Simplification of critical point 2 (-1.000,0.974)

NR converged at iteration = 3

Refined root: (-1.0000, 0.9990)

Simplification of critical point 3 (1.000,-0.974)

NR converged at iteration = 3

Refined root: (1.0000, -0.9990)

Simplification of critical point 4 (1.000,0.974)

NR converged at iteration = 3

Refined root: (1.0000, 0.9990)

Simplification of critical point 5 (-1.308,-0.564)

NR converged at iteration = 13

Refined root: (-1.4098, -0.0740)

Simplification of critical point 6 (-1.308,0.564)

NR converged at iteration = 13

Duplicate found. Separation = 0.1479

Refined root: (-1.4098, -0.0740)

Simplification of critical point 7 (1.308,-0.564)

NR converged at iteration = 13

Refined root: (1.4098, -0.0740)

Simplification of critical point 8 (1.308,0.564)

NR converged at iteration = 13

Duplicate found. Separation = 0.1479

Refined root: (1.4098, -0.0740)

Simplification of critical point 9 (-1.154,-0.872)

NR converged at iteration = 6

Duplicate found. Separation = 0.0002

Refined root: (1.4098, -0.0740)

Simplification of critical point 10 (-1.154,0.872)

NR converged at iteration = 6

Duplicate found. Separation = 0.0002

Refined root: (1.4098, -0.0740)

Simplification of critical point 11 (1.154,-0.872)

NR converged at iteration = 6

Duplicate found. Separation = 0.0002

Refined root: (1.4098, -0.0740)

Simplification of critical point 12 (1.154,0.872)

NR converged at iteration = 6

Duplicate found. Separation = 0.0002

Refined root: (1.4098, -0.0740)

Simplification of critical point 13 (-1.308,-0.667)

NR converged at iteration = 13

Duplicate found. Separation = 0.0000

Refined root: (1.4098, -0.0740)

Simplification of critical point 14 (-1.308,0.667)

NR converged at iteration = 13

Duplicate found. Separation = 0.1479

Refined root: (1.4098, -0.0740)

Simplification of critical point 15 (1.308,-0.667)

NR converged at iteration = 13

Duplicate found. Separation = 0.0000

Refined root: (1.4098, -0.0740)

Simplification of critical point 16 (1.308,0.667)

NR converged at iteration = 13

Duplicate found. Separation = 0.1479

Refined root: (1.4098, -0.0740)

Final no. of critical points found = 6

Finished calculating integral lines for critical point 1

Finished calculating integral lines for critical point 2

Finished calculating integral lines for critical point 3

Finished calculating integral lines for critical point 4

Finished calculating integral lines for critical point 5

Finished calculating integral lines for critical point 6

On running test field 4:

Choose a test field by selecting number between 1 and 4:4

Trying Test Field 4

Displaying simplified vector field topology of test field 4

Critical point search:

==========

Guesses of critical points (20)

Revising

==========

(-0.6923,-1.0769) -> diff. from minimum = 0.0000: Accepted

(-0.6923,1.0769) -> diff. from minimum = 0.0000: Accepted

(0.6923,-1.0769) -> diff. from minimum = 0.0000: Accepted

(0.6923,1.0769) -> diff. from minimum = 0.0000: Accepted

(-0.5385,-1.1795) -> diff. from minimum = 0.0296: Rejected

(-0.5385,1.1795) -> diff. from minimum = 0.0296: Rejected

(0.5385,-1.1795) -> diff. from minimum = 0.0296: Rejected

(0.5385,1.1795) -> diff. from minimum = 0.0296: Rejected

(-0.5385,-1.0769) -> diff. from minimum = 0.0561: Rejected

(-0.5385,1.0769) -> diff. from minimum = 0.0561: Rejected

(0.5385,-1.0769) -> diff. from minimum = 0.0561: Rejected

(0.5385,1.0769) -> diff. from minimum = 0.0561: Rejected

(-0.6923,-0.9744) -> diff. from minimum = 0.0595: Rejected

(-0.6923,0.9744) -> diff. from minimum = 0.0595: Rejected

(0.6923,-0.9744) -> diff. from minimum = 0.0595: Rejected

(0.6923,0.9744) -> diff. from minimum = 0.0595: Rejected

(-0.8462,-0.9744) -> diff. from minimum = 0.0650: Rejected

(-0.8462,0.9744) -> diff. from minimum = 0.0650: Rejected

(0.8462,-0.9744) -> diff. from minimum = 0.0650: Rejected

(0.8462,0.9744) -> diff. from minimum = 0.0650: Rejected

Revised no. of critical points = 4

(-0.6923 -1.0769)

(-0.6923 1.0769)

(0.6923 -1.0769)

(0.6923 1.0769)

==========

Simplification of critical point 1 (-0.692,-1.077)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (-0.6923, -1.0769)

Simplification of critical point 2 (-0.692,1.077)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (-0.6923, 1.0769)

Simplification of critical point 3 (0.692,-1.077)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (0.6923, -1.0769)

Simplification of critical point 4 (0.692,1.077)

Singular matrix found while performing iterations in Newton-Raphson.

Refined root: (0.6923, 1.0769)

Final no. of critical points found = 4

Finished calculating integral lines for critical point 1

Finished calculating integral lines for critical point 2

Finished calculating integral lines for critical point 3

Finished calculating integral lines for critical point 4