

```
In [1]: import os
import json
from cog_analysis import analyze_session

summary = []

base_dir = "../Data_Sailnjord/Straight_lines"

# Scan de tous les dossiers de date
for date_folder in sorted(os.listdir(base_dir)):
    date_path = os.path.join(base_dir, date_folder)

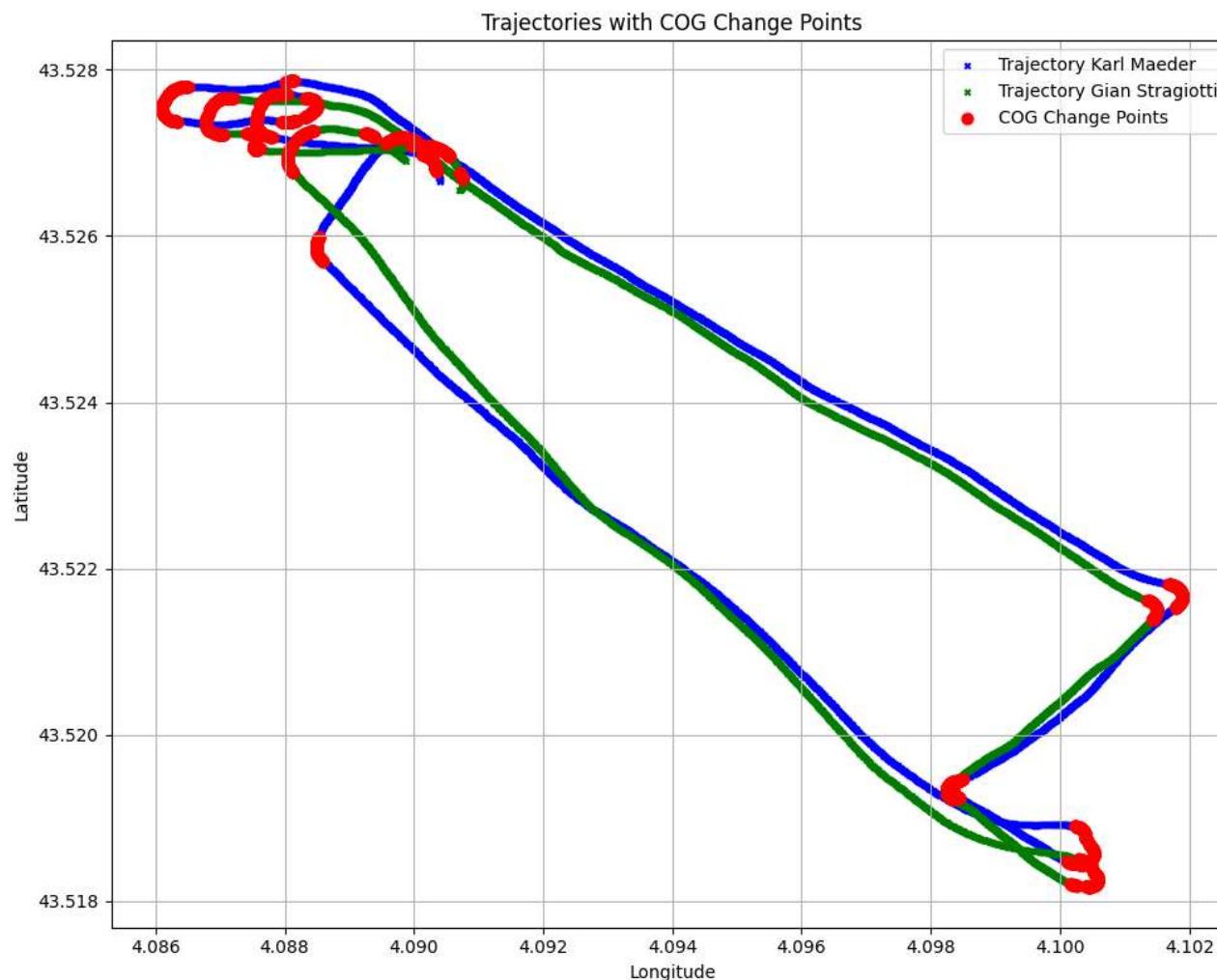
    # Scan de tous les runs dans chaque dossier de date
    for run_folder in sorted(os.listdir(date_path)):
        run_path = os.path.join(date_path, run_folder)

        # Cherche 2 fichiers .csv
        csv_files = [f for f in os.listdir(run_path) if f.endswith(".csv")]
        if len(csv_files) != 2:
            print(f"Ignoré: {run_path} (attendu 2 CSV, trouvé {len(csv_files)}")
            continue
        csv_paths = [os.path.join(run_path, f) for f in csv_files]
        print(f"Analyse: {csv_files[0]} et {csv_files[1]} dans {run_path}")
        try:
            longest_intervals = analyze_session(csv_paths[0], csv_paths[1])
            summary.append({
                "run": run_folder,
                "intervals": longest_intervals
            })
        except Exception as e:
            print(f"Erreur dans {run_path} : {e}")

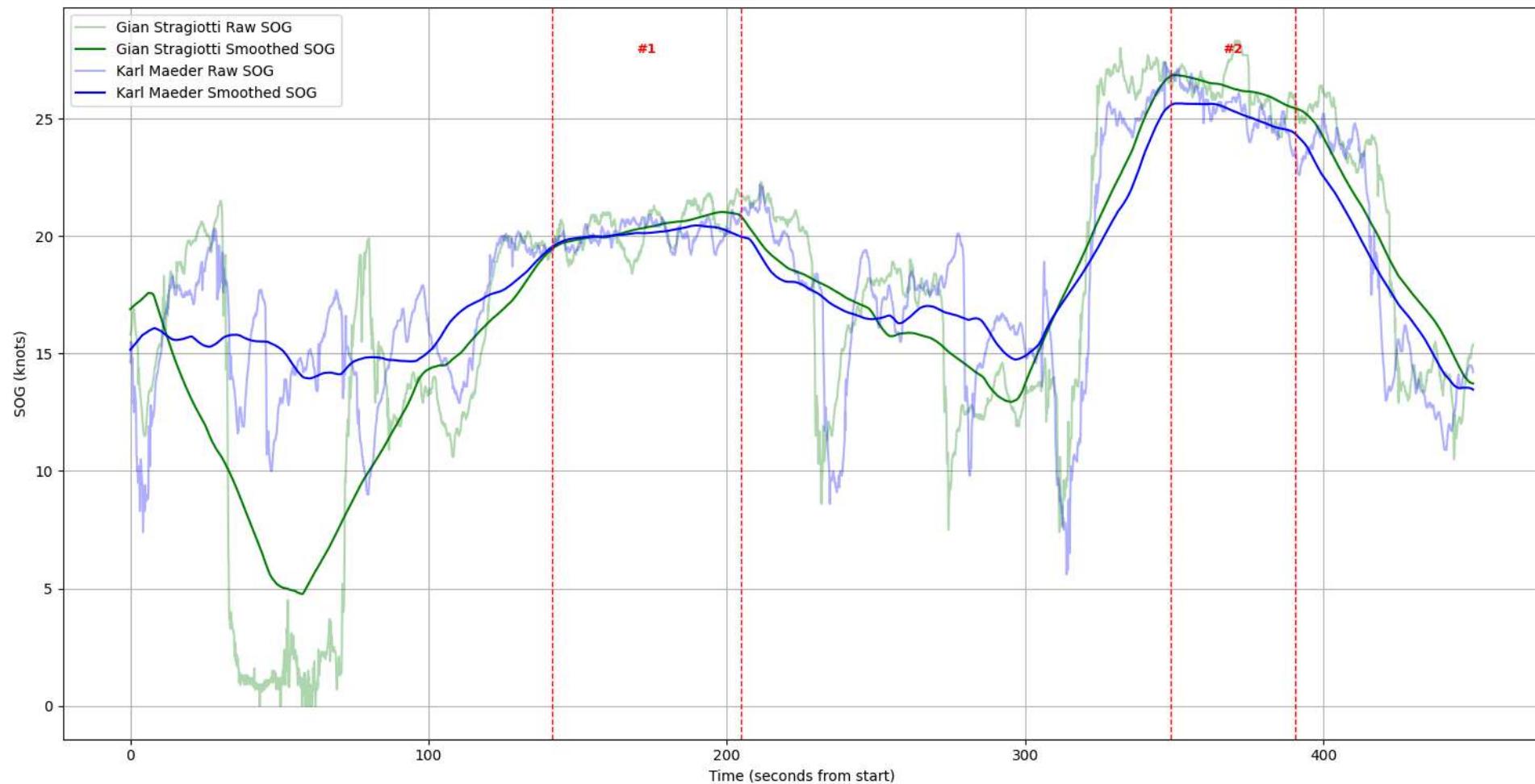
# Sauvegarde du résumé (tout est reconstruit à chaque fois)
summary_file = "summary.json"
with open(summary_file, "w") as f:
    json.dump(summary, f, indent=2)

print(f"Résumé complet sauvegardé ({len(summary)} runs)")
```

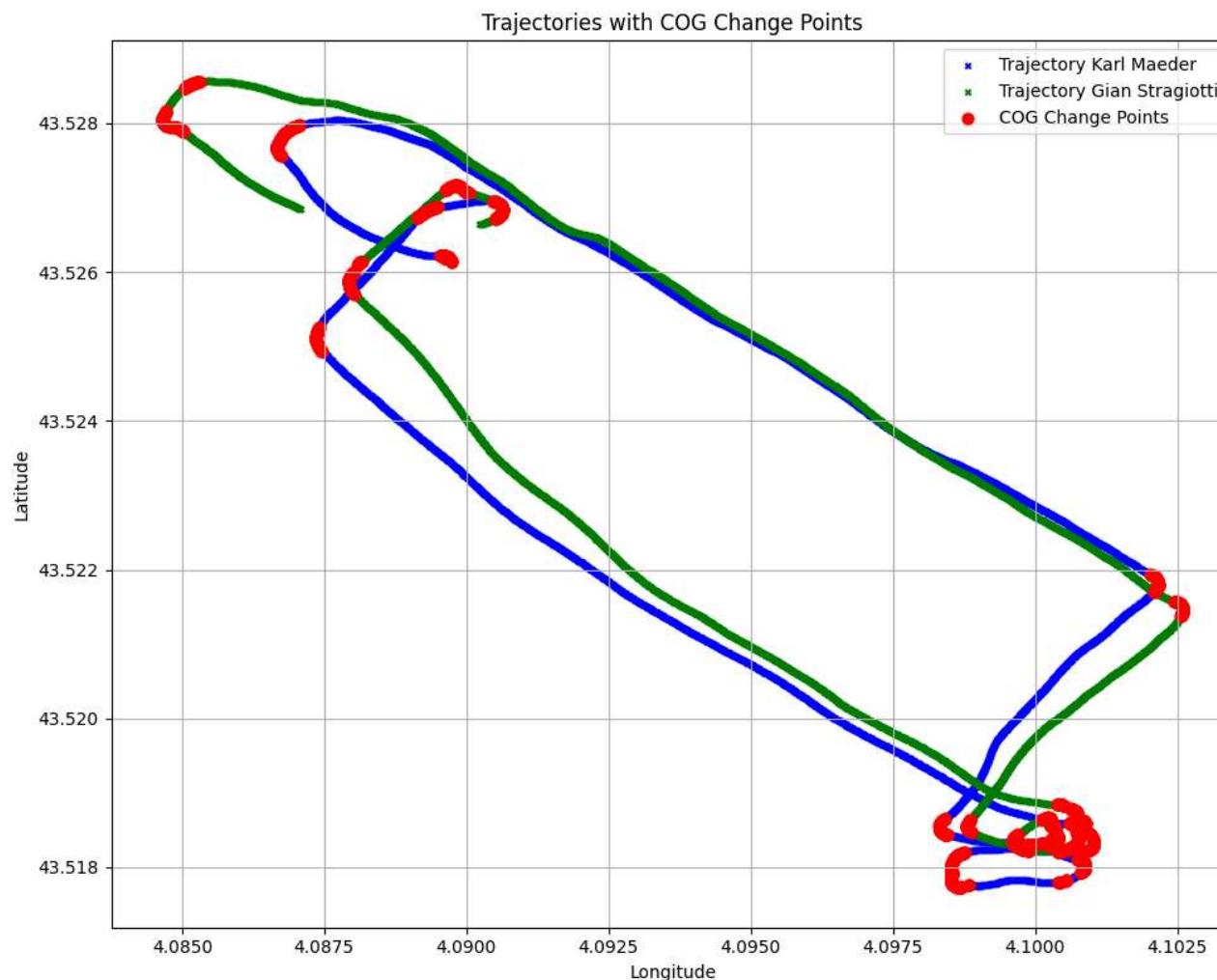
Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans ../Data_Sailnjord/Straight_lines\06_06\06_06_Run1

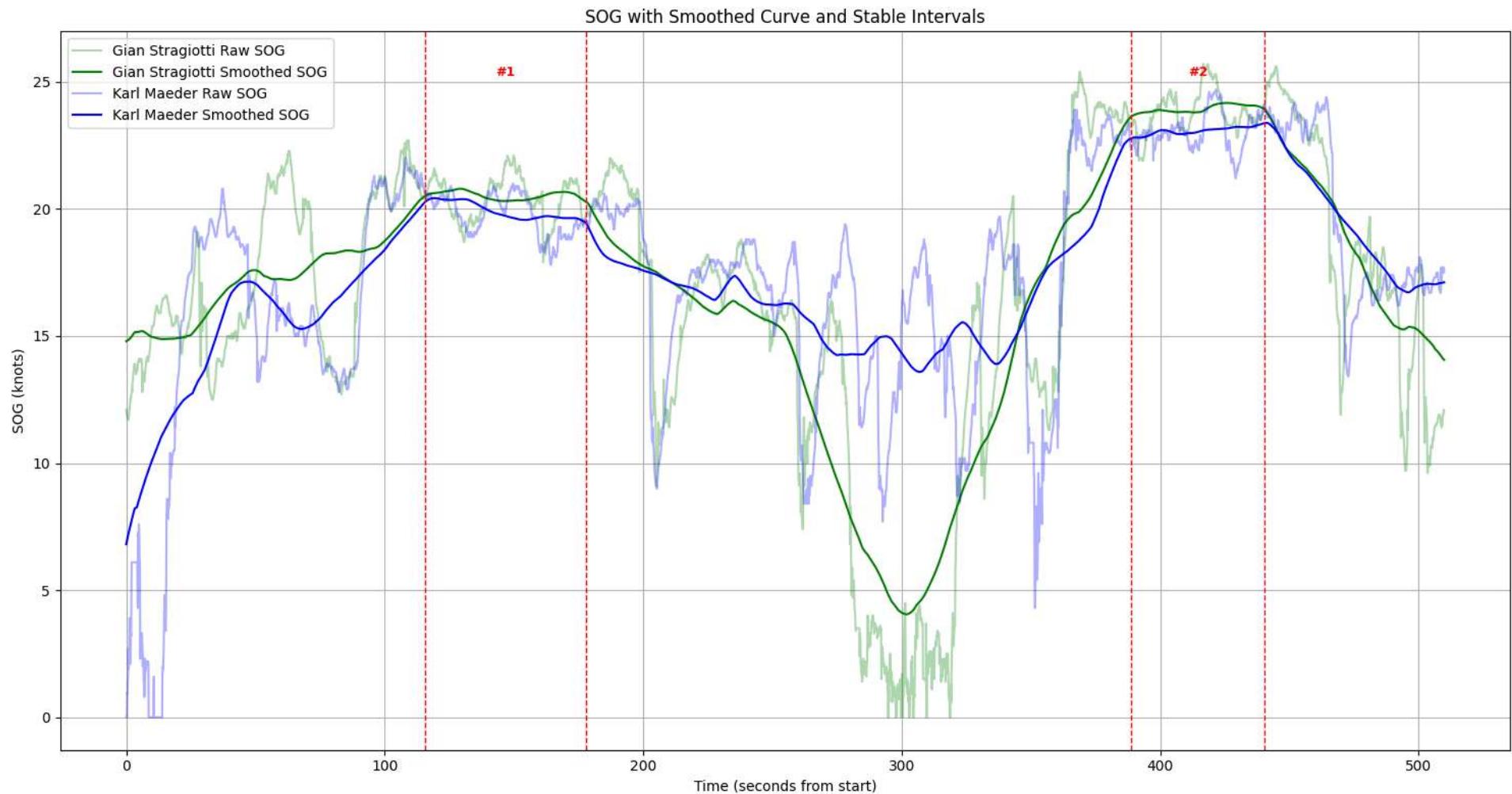


SOG with Smoothed Curve and Stable Intervals

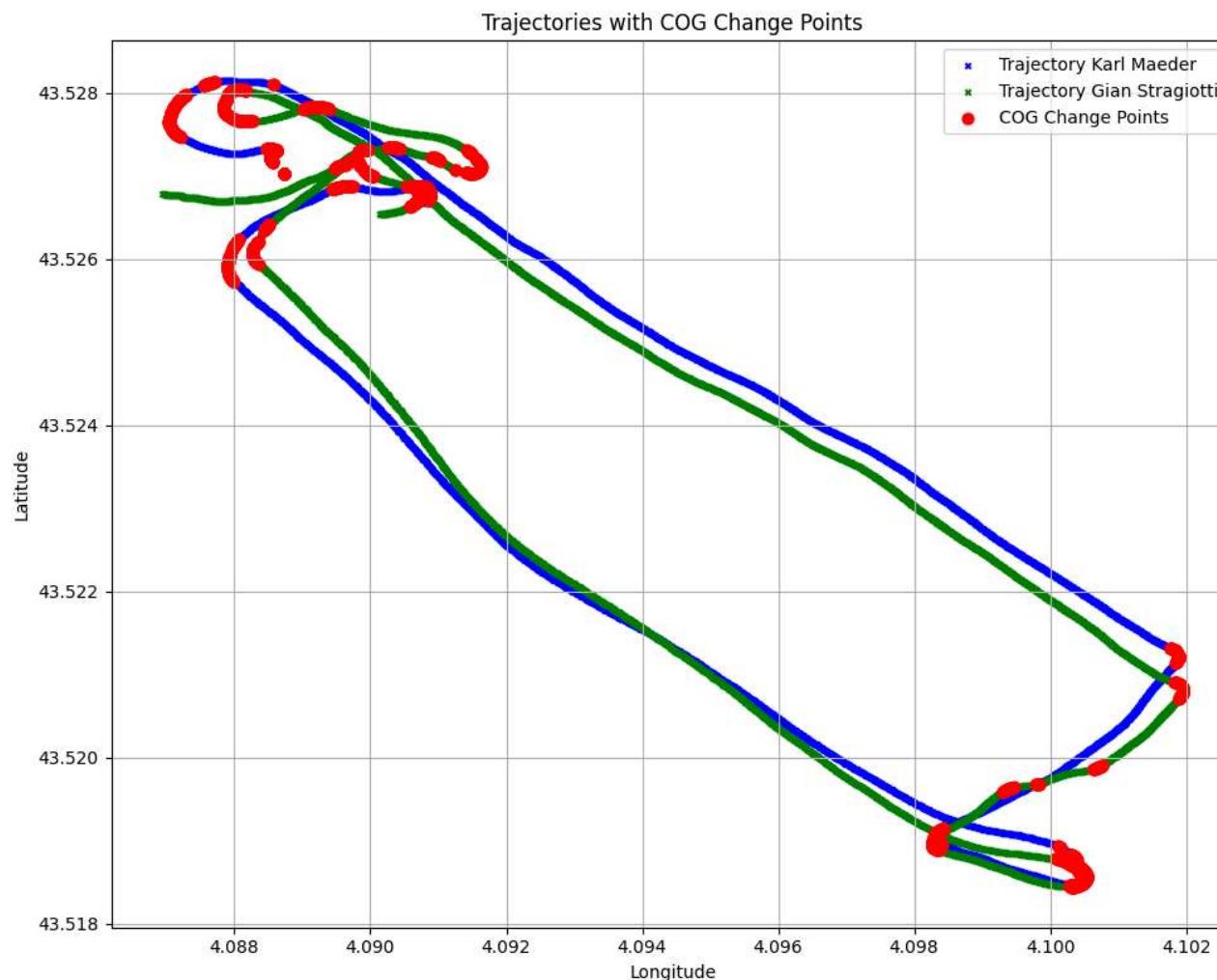


Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans ..\Data_Sailnjord\Straight_lines\06_06\06_06_Run2

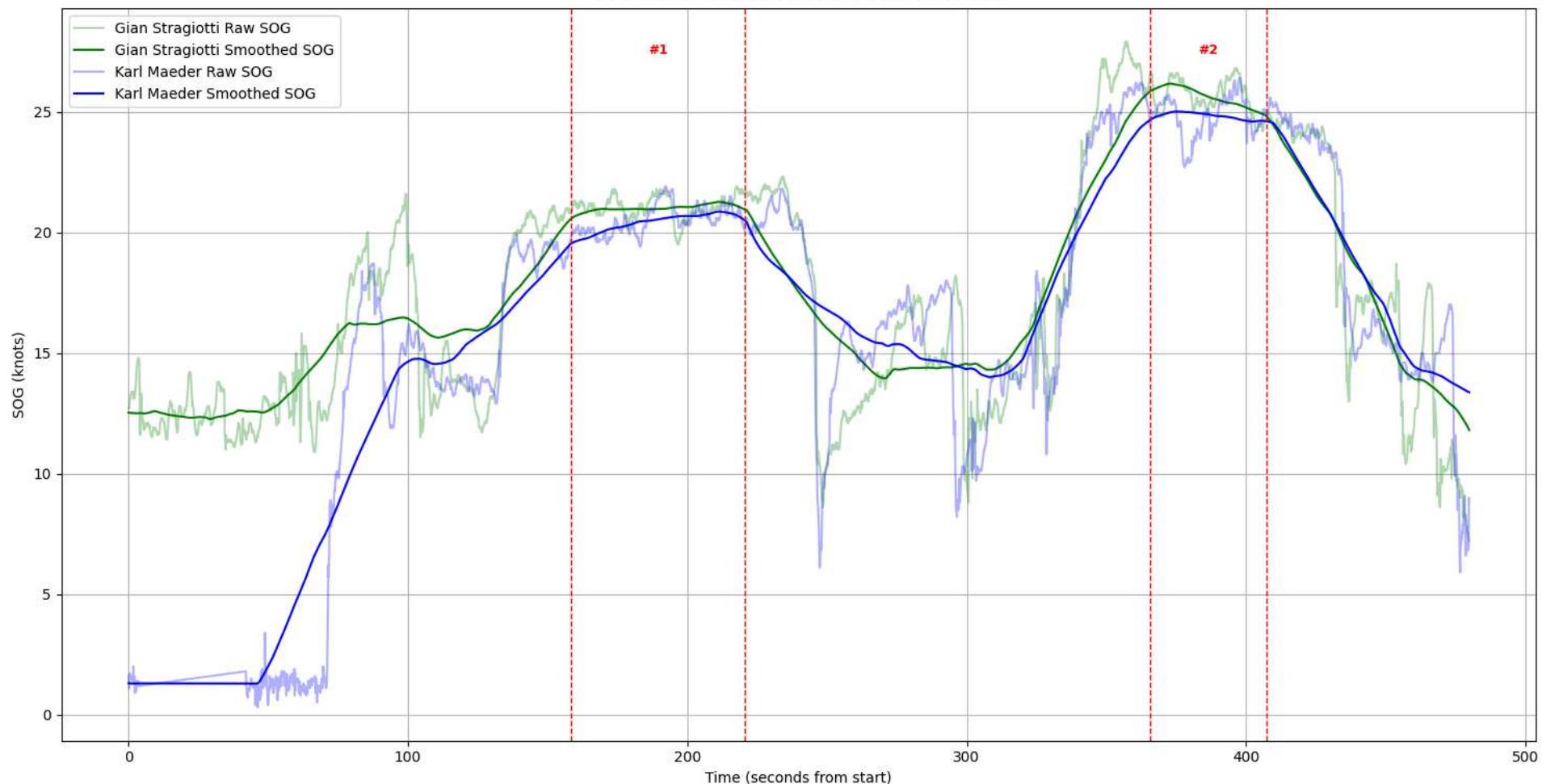




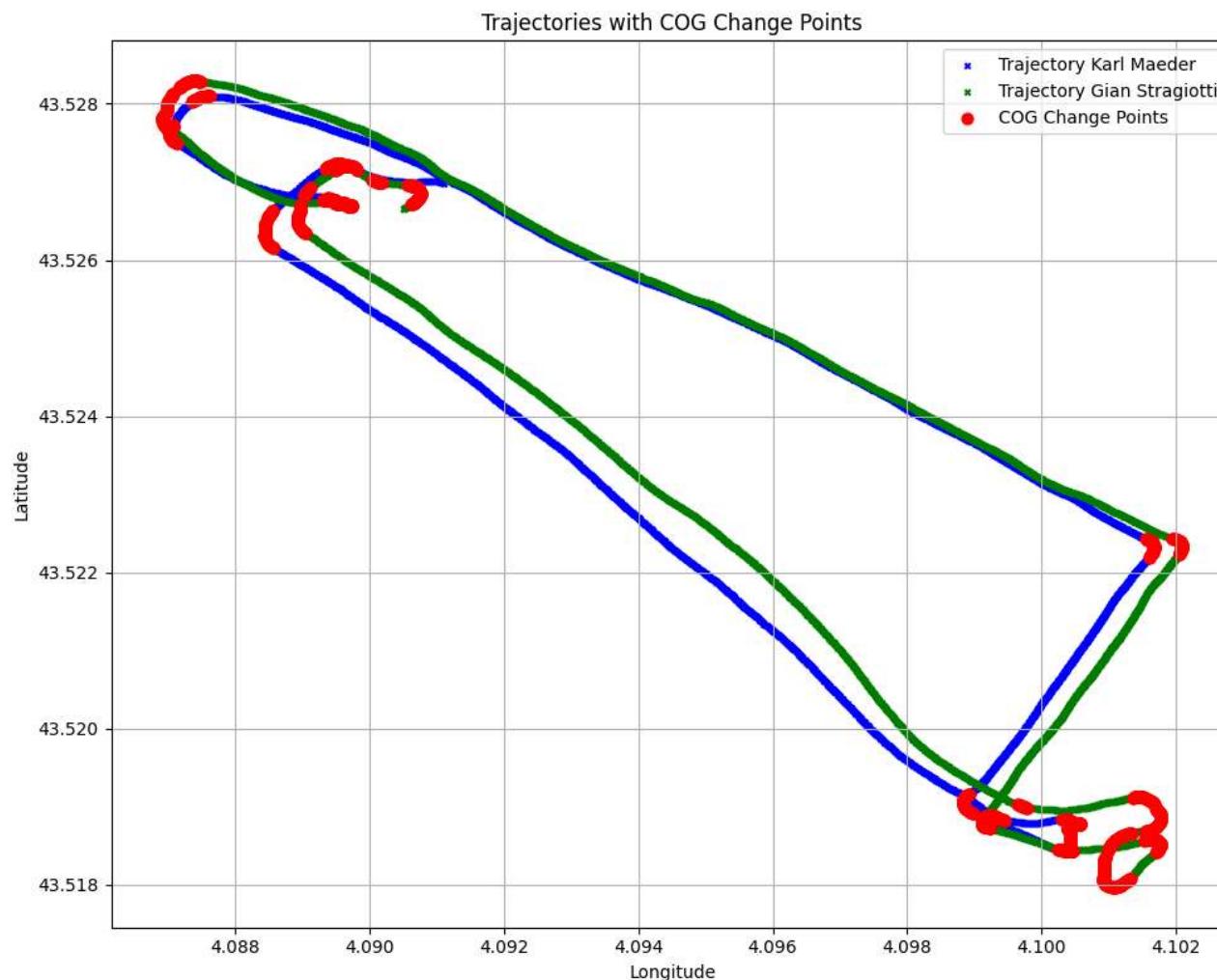
Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans/Data_Sailnjord/Straight_lines\06_06\06_06_Run3

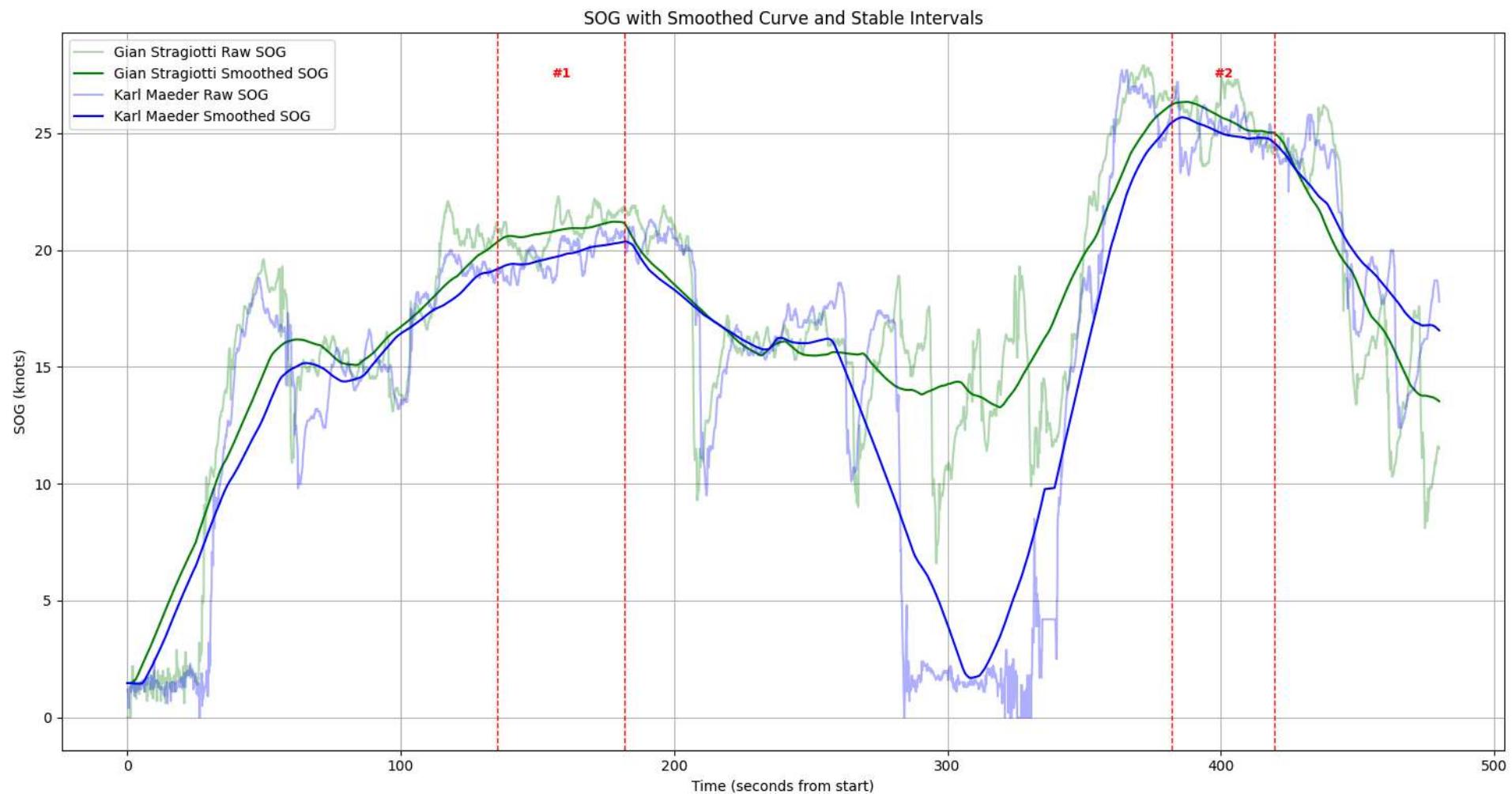


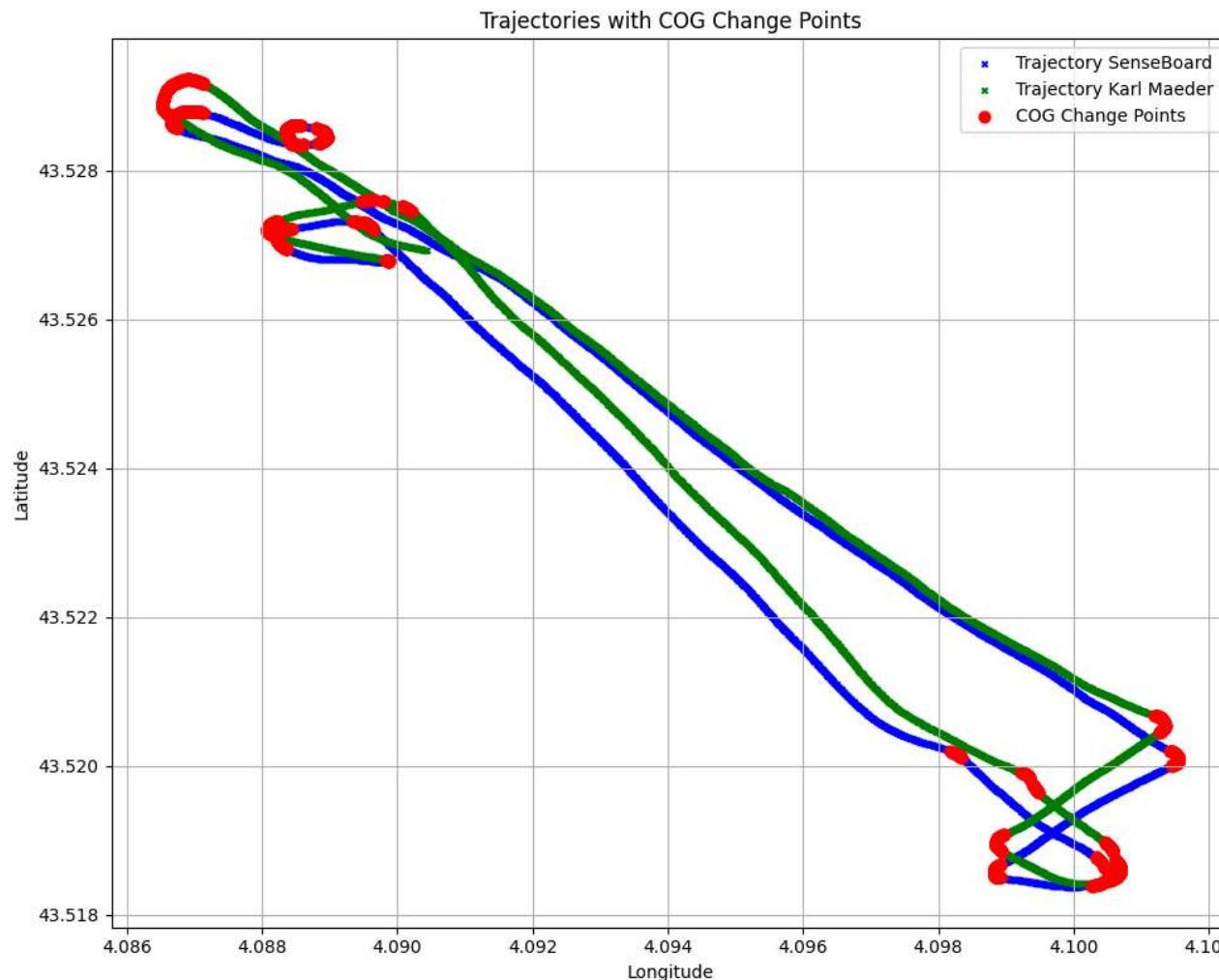
SOG with Smoothed Curve and Stable Intervals

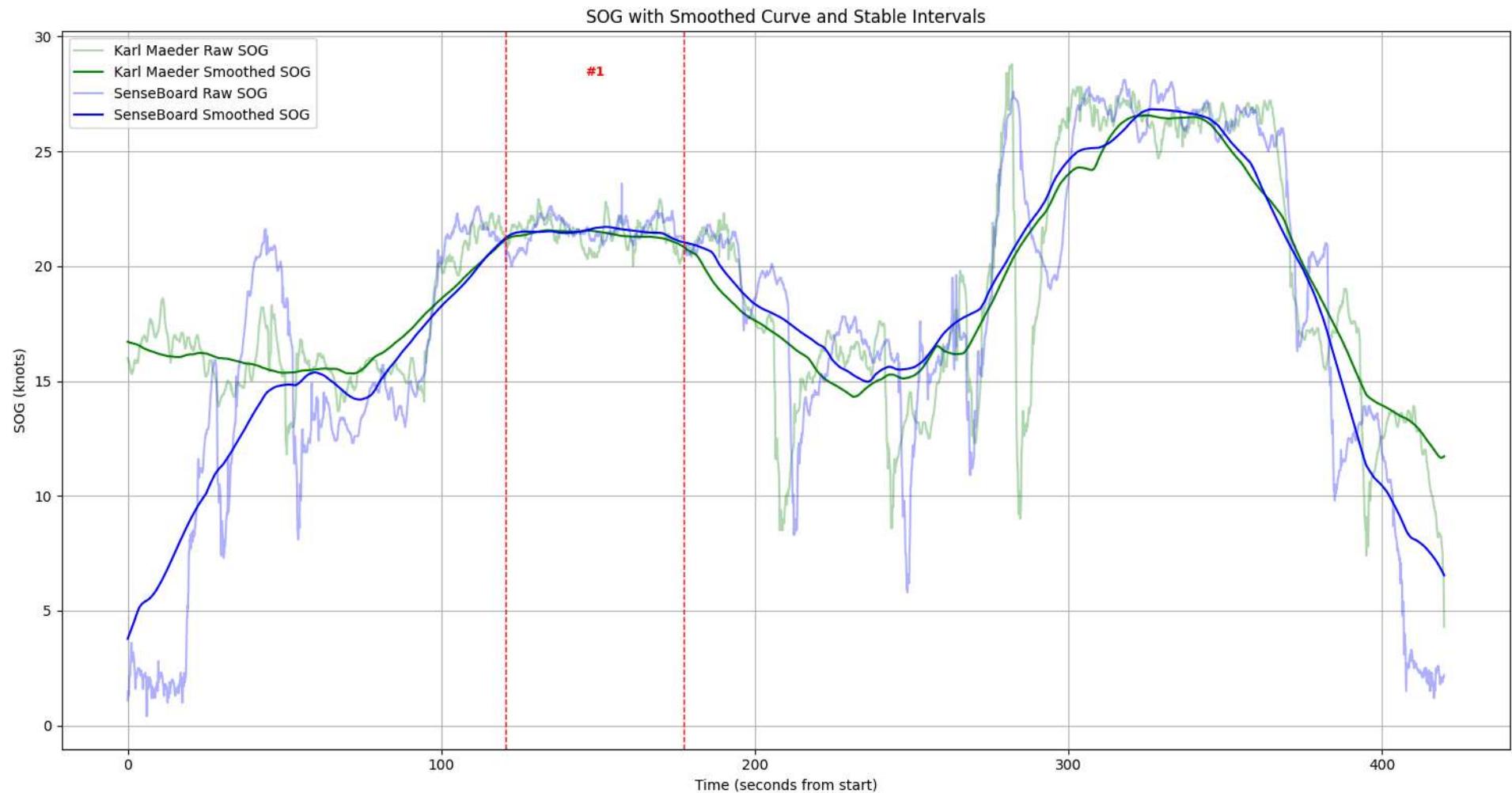


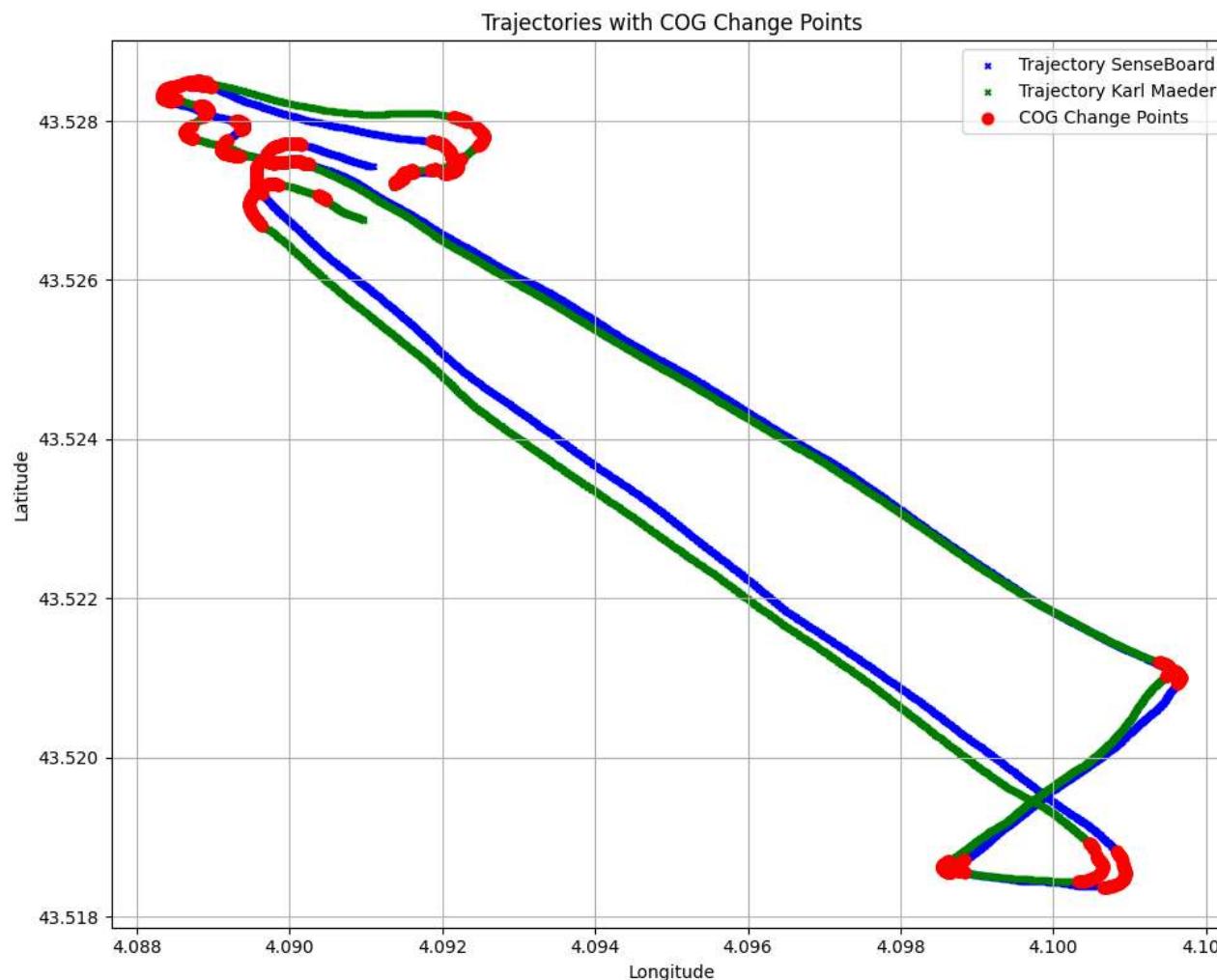
Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans ..\Data_Sailnjord\Straight_lines\06_06\06_06_Run4

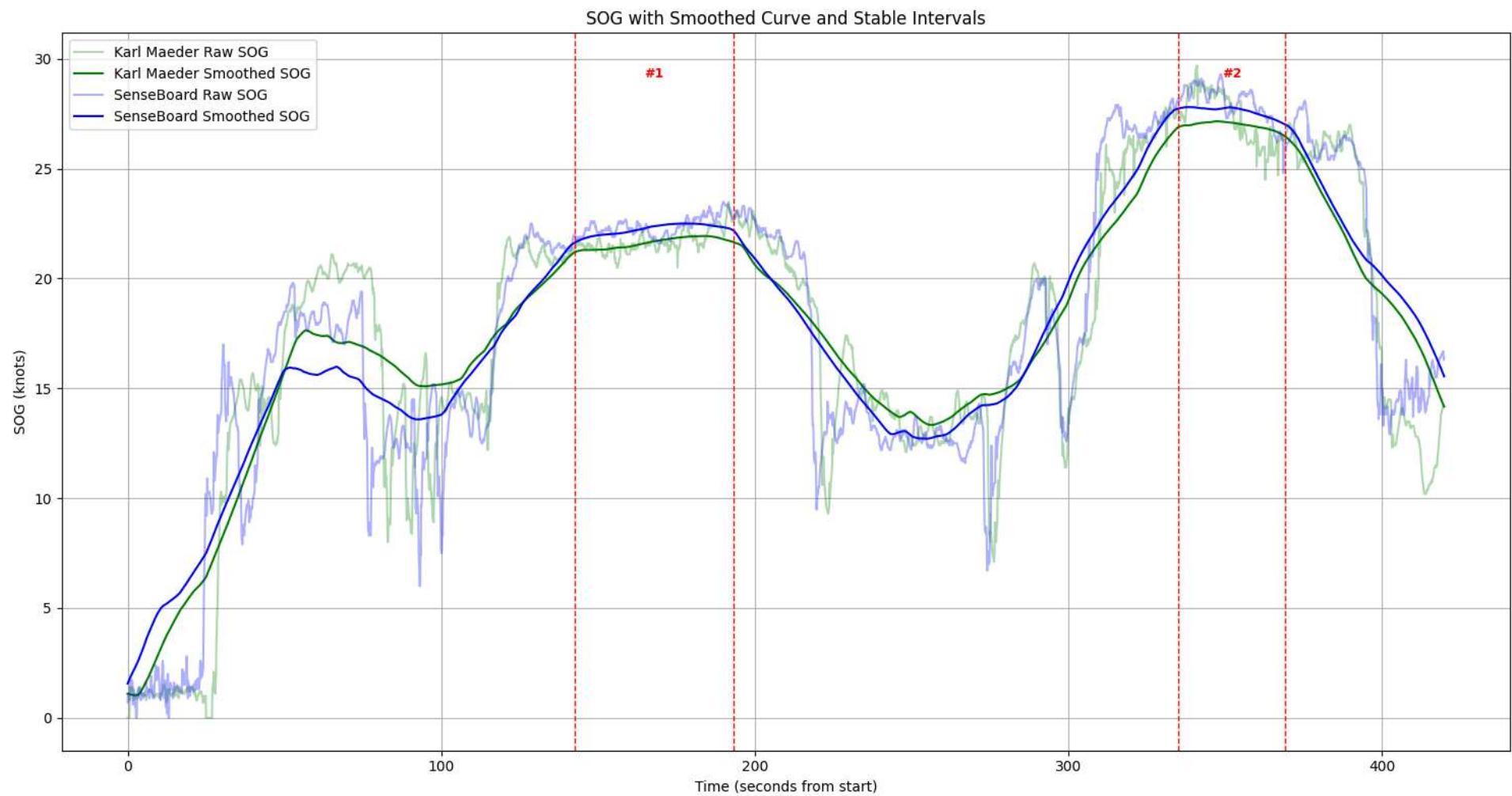




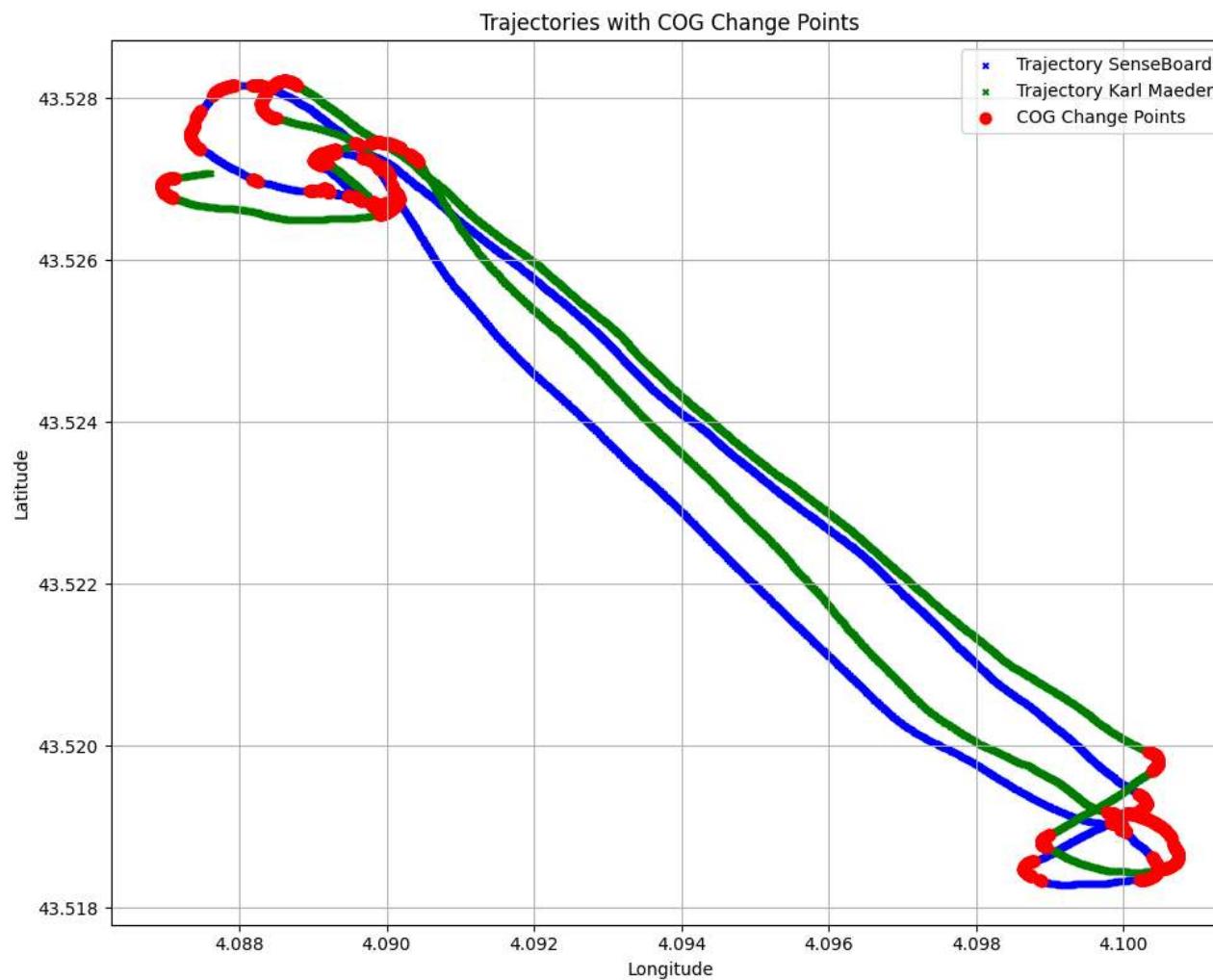


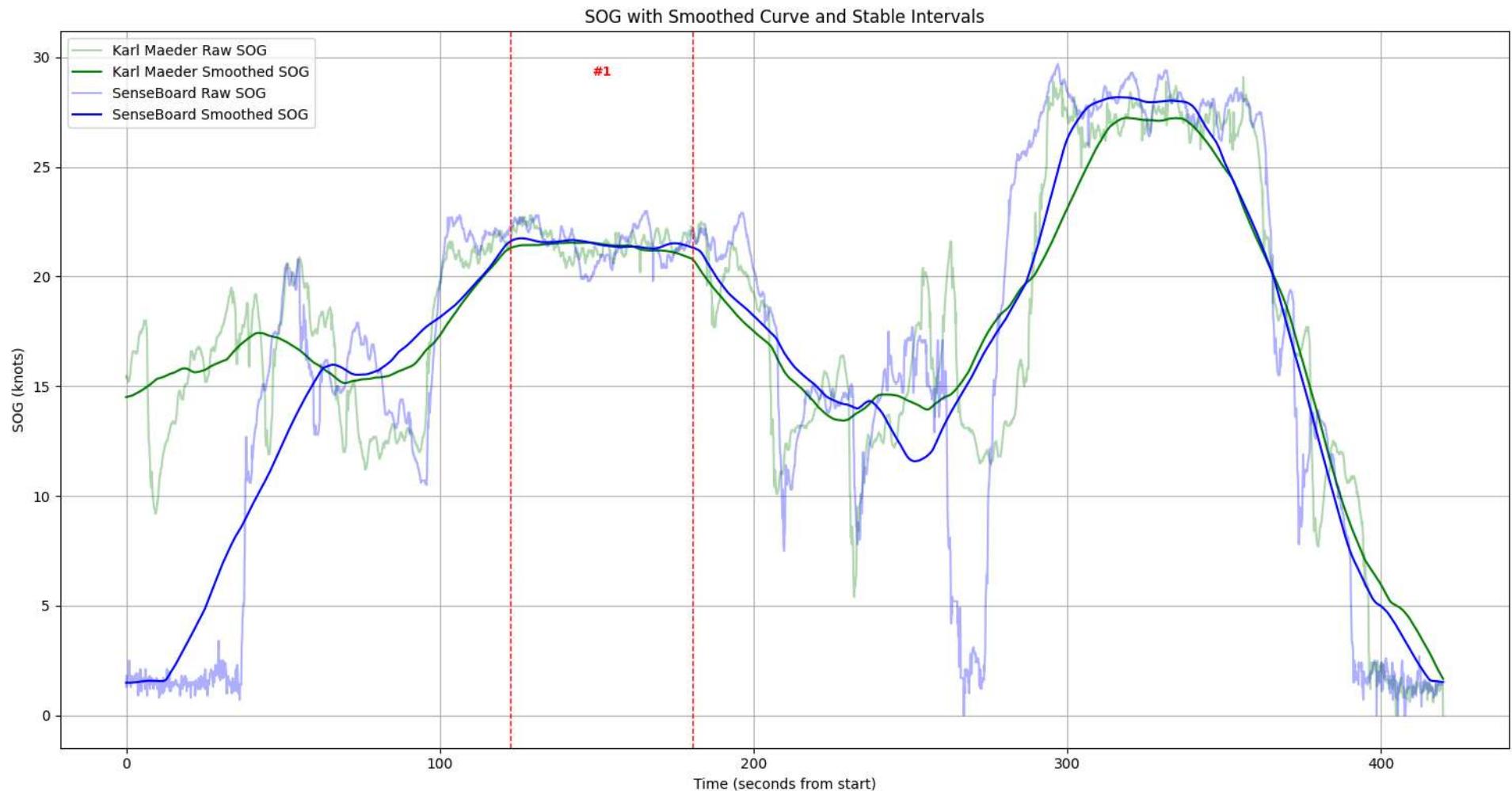


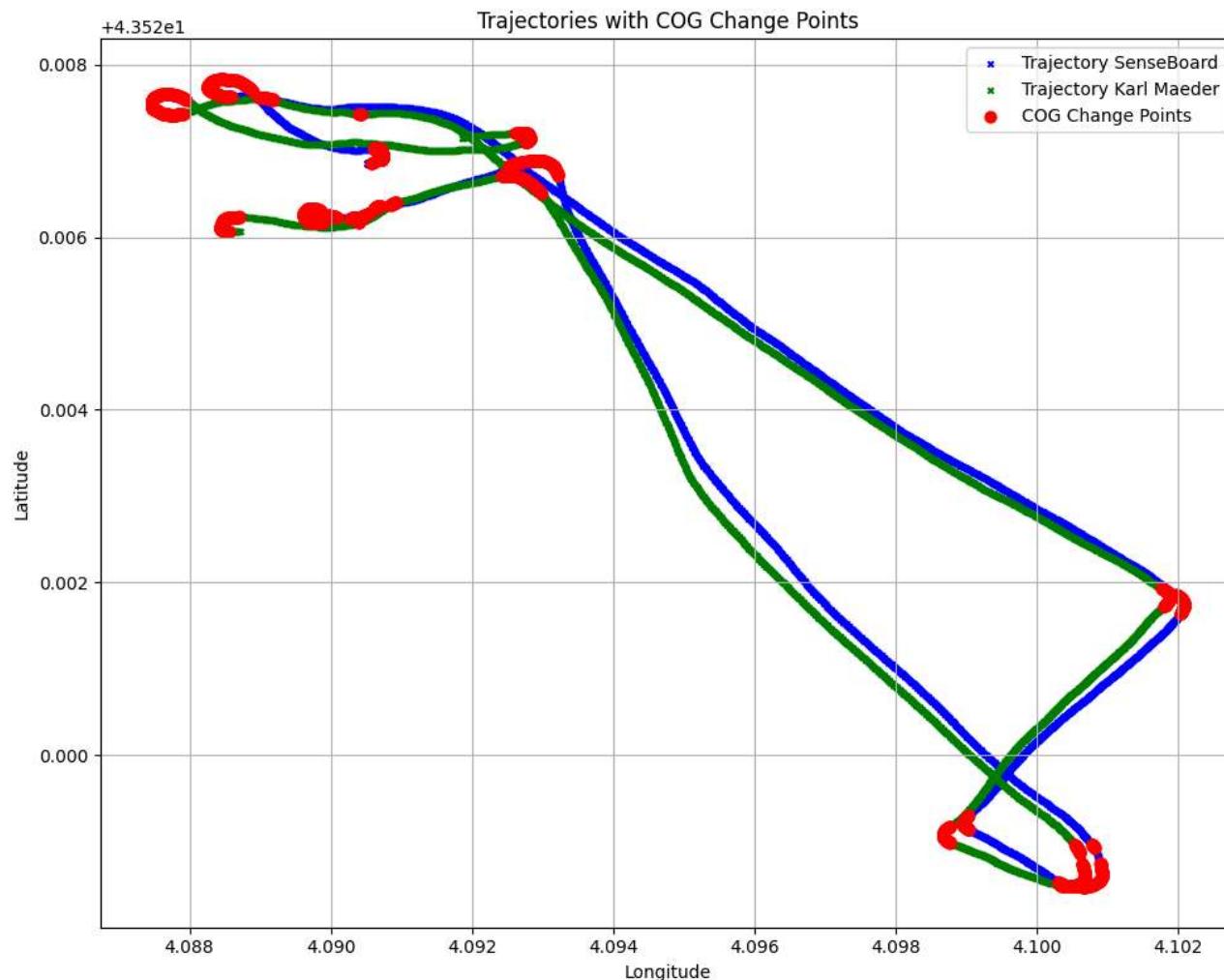


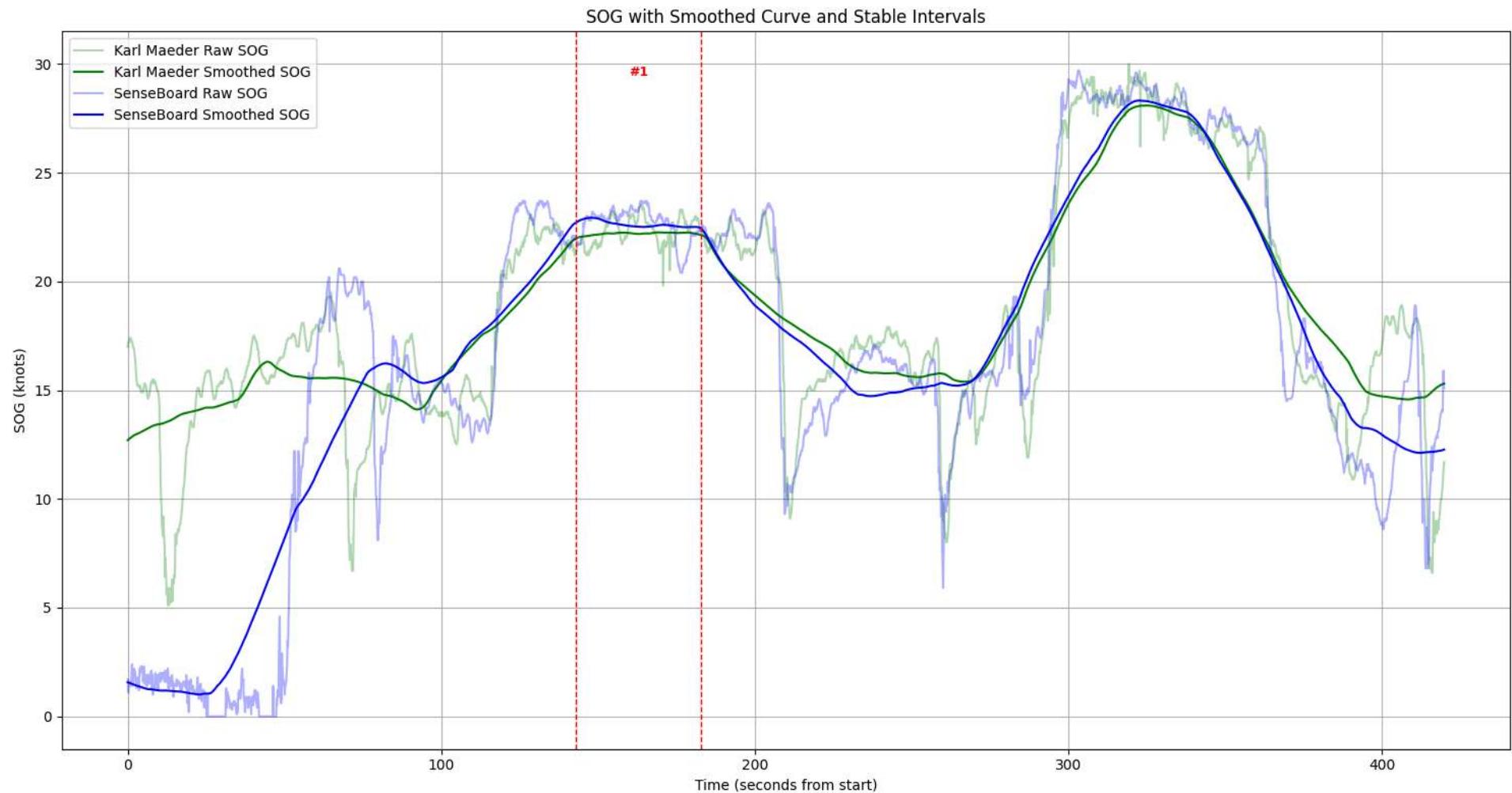


Analyse: Karl Maeder.csv et SenseBoard.csv dans/Data_Sailnjord/Straight_lines\06_06\06_06_Run7

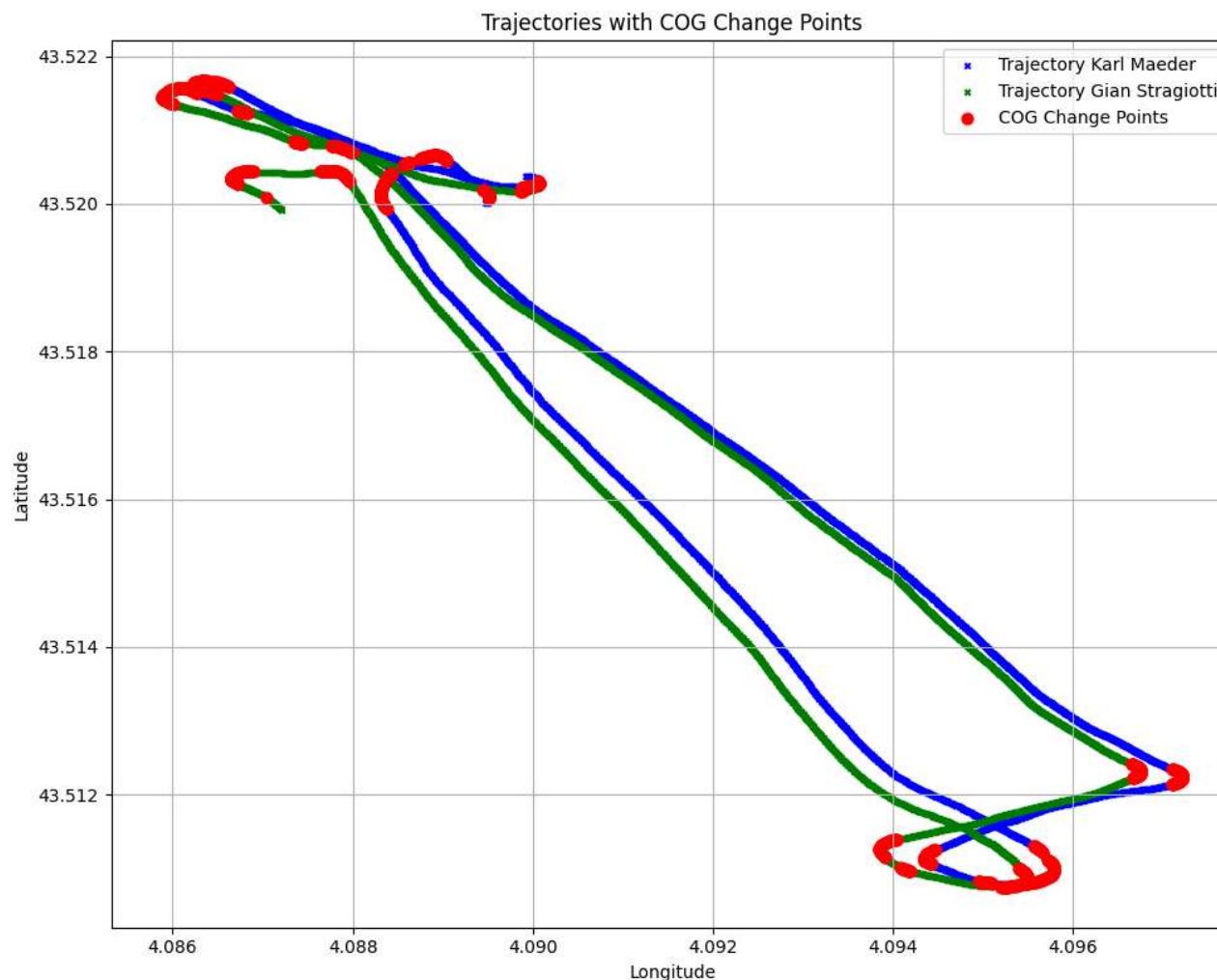


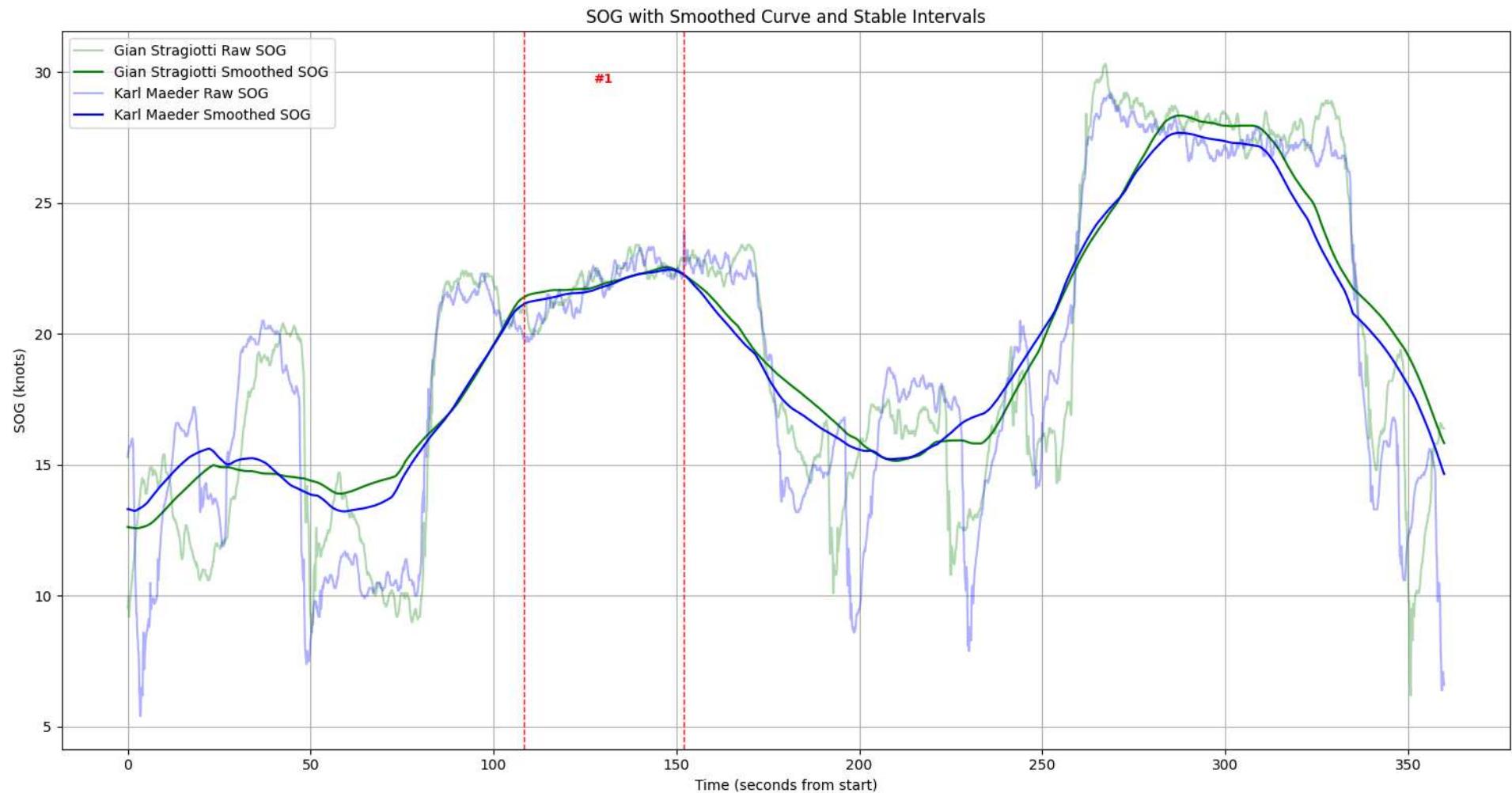




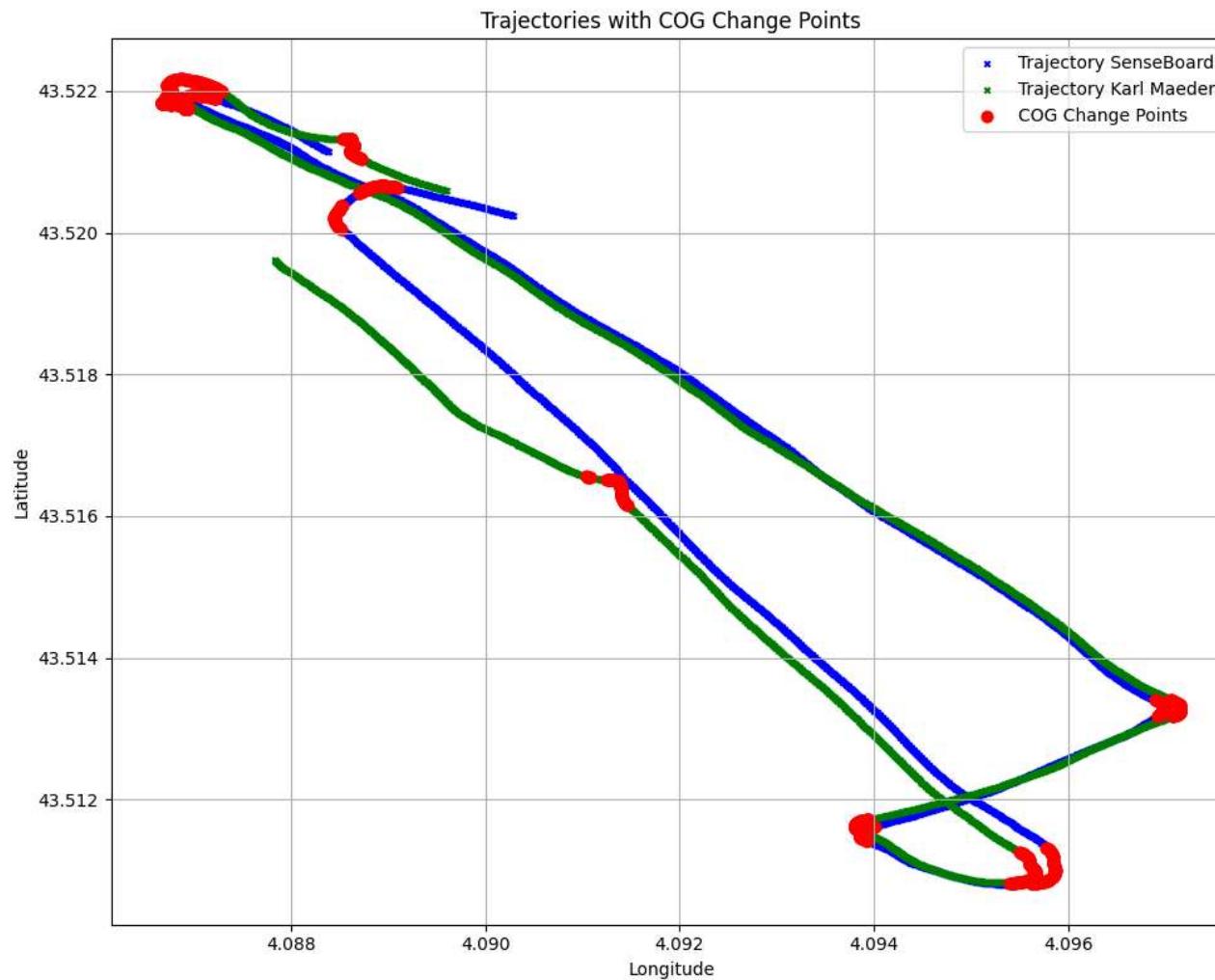


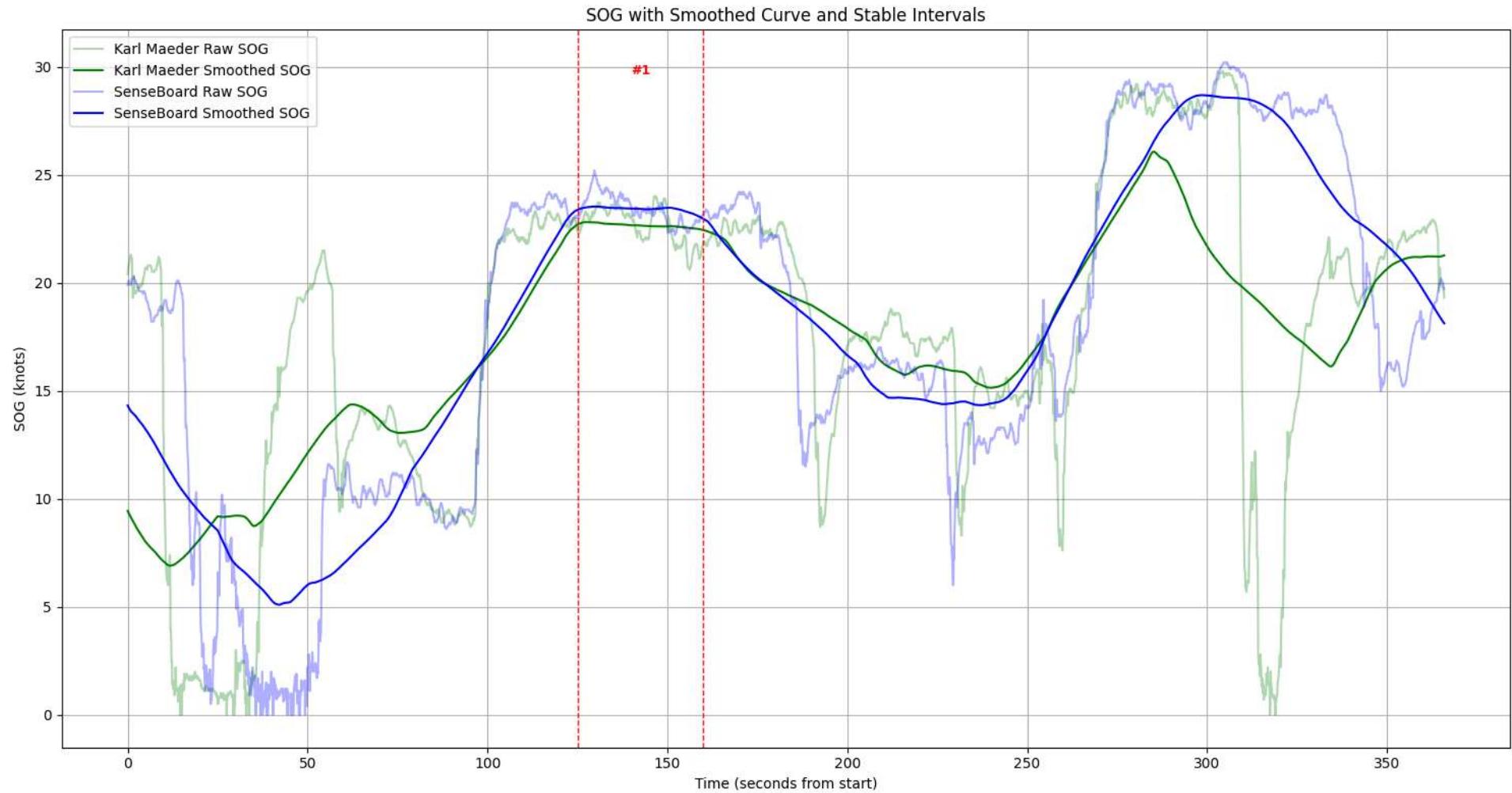
Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans ..\Data_Sailnjord\Straight_lines\07_06\07_06_Run1



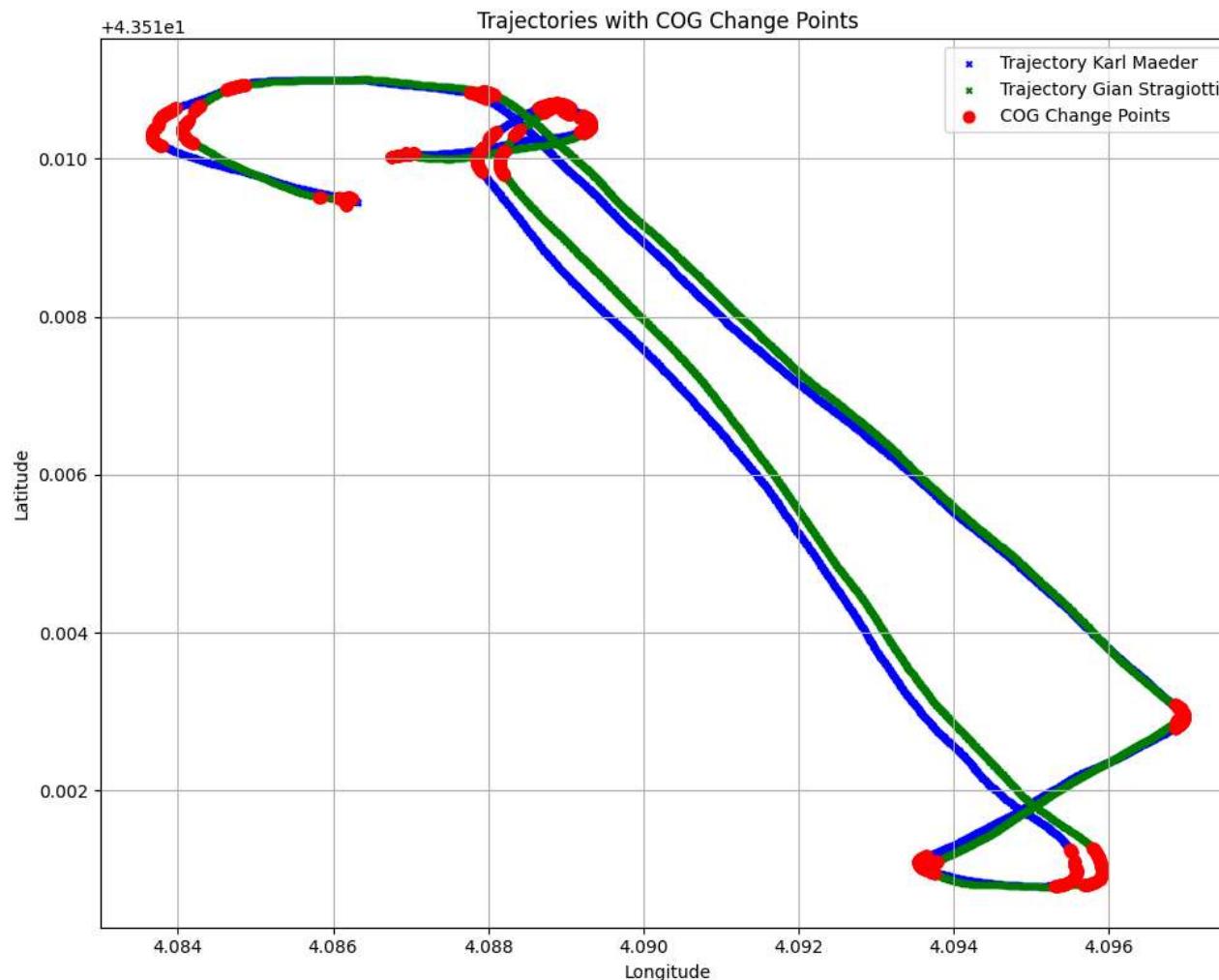


Analyse: Karl Maeder.csv et SenseBoard.csv dans/Data_Sailnjord/Straight_lines\07_06\07_06_Run10





Analyse: Gian Stragiotti.csv et Karl Maeder.csv dans/Data_Sailnjord/Straight_lines\07_06\07_06_Run2



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KeyboardInterrupt                                     Traceback (most recent call last)
Cell In[1], line 25
  23 print(f"Analyse: {csv_files[0]} et {csv_files[1]} dans {run_path}")
  24 try:
--> 25     longest_intervals = analyze_session(csv_paths[0], csv_paths[1])
   26     summary.append({
   27         "run": run_folder,
   28         "intervals": longest_intervals
   29     })
  30 except Exception as e:

File c:\Users\romai\OneDrive\Bureau\FormulaKite\fulltime\FormulaKiteDataAnalysis\Straight Run\cog_analysis.py:663, in analyze_session(boat1_path, boat2_path)
  659 add_avg_twa_to_intervals(longest_intervals, boat1_df, boat2_df)
  661 # Plot the longest trajectory segments
  662 # plot_longest_segments(boat1_df, boat2_df, longest_intervals, boat1_name, boat2_name)
--> 663 plot_sog_with_intervals(boat1_df, boat2_df, longest_intervals, boat1_name, boat2_name)
  665 return longest_intervals

File c:\Users\romai\OneDrive\Bureau\FormulaKite\fulltime\FormulaKiteDataAnalysis\Straight Run\cog_analysis.py:587, in plot_sog_with_intervals(boat1_df, boat2_df, intervals, boat1_name, boat2_name)
  585 end = interval['end_time'] - time_offset
  586 plt.axvline(start, color='red', linestyle='--', linewidth=1)
--> 587 plt.axvline(end, color='red', linestyle='--', linewidth=1)
  588 plt.text((start + end) / 2, plt.ylim()[1]*0.95, f"#{i}", color='red',
  589          ha='center', va='top', fontsize=9, fontweight='bold', rotation=0)
  591 plt.xlabel('Time (seconds from start)')

File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\pyplot.py:2353, in axvline(x, ymin, ymax, **kwargs)
 2351 @_copy_docstring_and_deprecators(Axes.axvline)
 2352 def axvline(x=0, ymin=0, ymax=1, **kwargs):
--> 2353     return gca().axvline(x=x, ymin=ymin, ymax=ymax, **kwargs)

File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\axes\_axes.py:830, in Axes.axvline(self, x, ymin, ymax, **kwargs)
  828 trans = self.get_xaxis_transform(which='grid')
  829 l = mlines.Line2D([x, x], [ymin, ymax], transform=trans, **kwargs)
--> 830 self.add_line(l)
  831 if scalex:
  832     self._request_autoscale_view("x")

File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\axes\_base.py:2340, in _AxesBase.add_line(self, line)
 2337 if line.get_clip_path() is None:
 2338     line.set_clip_path(self.patch)
--> 2340 self._update_line_limits(line)
 2341 if not line.get_label():
 2342     line.set_label(f'_child{len(self._children)}')

File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\axes\_base.py:2380, in _AxesBase._update_line_limits(self, line)
 2378 line_trans_path = line._get_transformed_path()
 2379 na_path, _ = line_trans_path.get_transformed_path_and_affine()
--> 2380 data_path = trf_to_data.transform_path_affine(na_path)
 2381 else:
 2382     data_path = trf_to_data.transform_path(path)

File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\transforms.py:1605, in Transform.transform_path_affine(self, path)
 1597 def transform_path_affine(self, path):
 1598     """
 1599     Apply the affine part of this transform to `Path` *path*, returning a
 1600     new `Path`.
 1601     """
 1603     ``transform_path_affine(transform_path_non_affine(values))``
 1604     """
--> 1605     return self.get_affine().transform_path_affine(path)

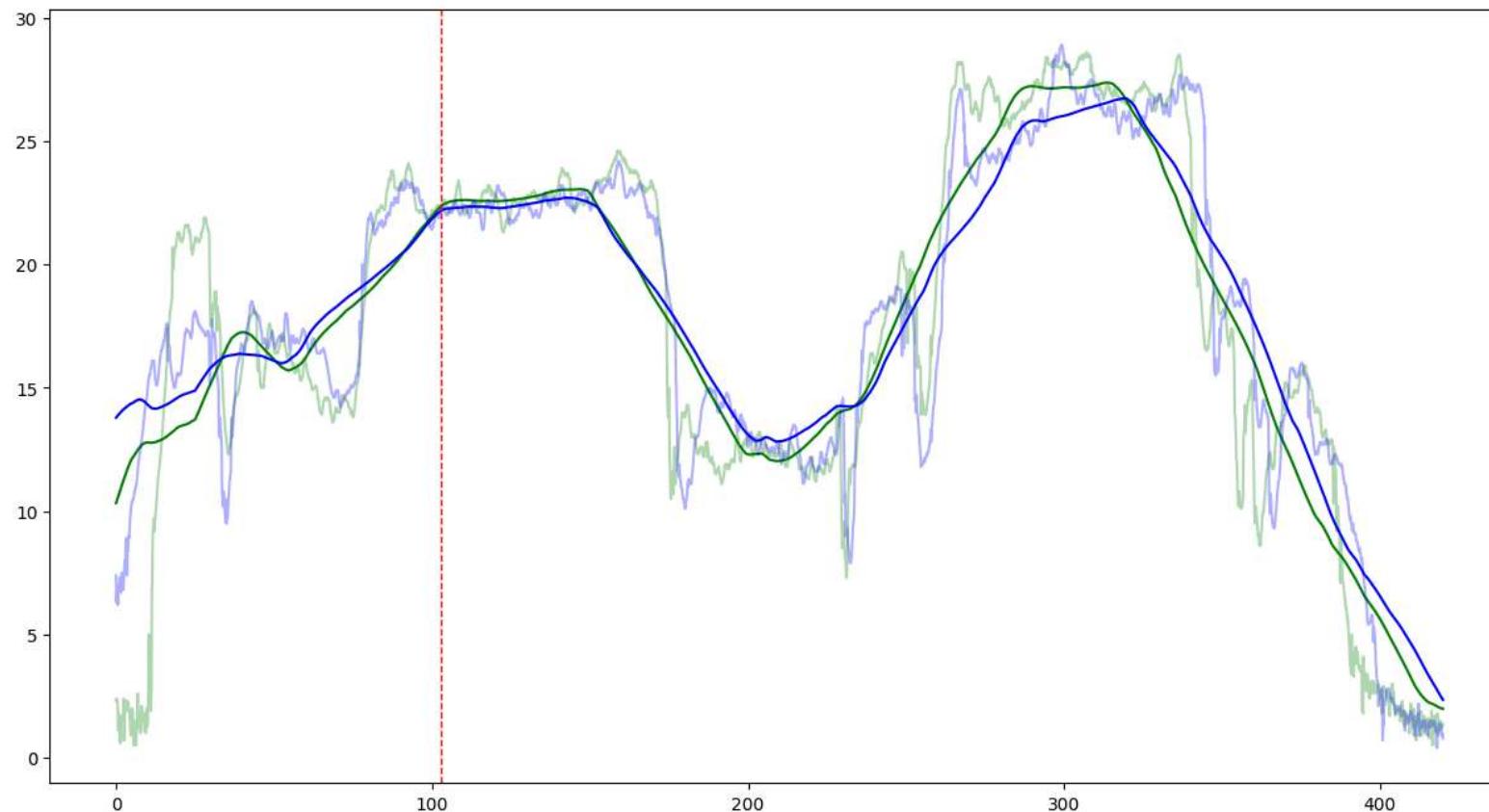
```

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File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\transforms.py:2446, in CompositeGenericTransform.get_affine(self)
2444     return self._b.get_affine()
2445 else:
-> 2446     return Affine2D(np.dot(self._b.get_affine().get_matrix(),
2447                               self._a.get_affine().get_matrix()))
2448
File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\transforms.py:2446, in CompositeGenericTransform.get_affine(self)
2444     return self._b.get_affine()
2445 else:
-> 2446     return Affine2D(np.dot(self._b.get_affine().get_matrix(),
2447                               self._a.get_affine().get_matrix()))
2448
File c:\Users\romai\anaconda3\envs\ada_exam_2024\lib\site-packages\matplotlib\transforms.py:1900, in Affine2D.__init__(self, matrix, **kwargs)
1897 if matrix is None:
1898     # A bit faster than np.identity(3).
1899     matrix = IdentityTransform._mtx.copy()
-> 1900 self._mtx = matrix.copy()
1901 self._invalid = 0

```

KeyboardInterrupt:



In []: `print(json.dumps(summary, indent=2))`

```
[
  {
    "run": "06_06_Run1",
    "intervals": [
      {
        "start_time": 1749217685.858,
        "end_time": 1749217779.657,
        "duration": 93.79900002479553,
        "boat1_name": "Gian Stragiotti",
        "boat2_name": "Karl Maeder",
        "avg_SOG_boat1": 20.419914802981896,
        "avg_SOG_boat2": 20.13056443024494,
        "SOG_variation_boat1": 0.8779079569029041,
        "SOG_variation_boat2": 0.5935085955012532,
        "stability_score": 0.9534661615117388,
        "avg TWA boat1": 47.77427050053248,
        "avg TWA boat2": 48.23743024494143
      },
      {
        "start_time": 1749217893.657,
        "end_time": 1749217966.256,
        "duration": 72.59899997711182,
        "boat1_name": "Gian Stragiotti",
        "boat2_name": "Karl Maeder",
        "avg_SOG_boat1": 26.22627235213205,
        "avg_SOG_boat2": 25.129160935350757,
        "SOG_variation_boat1": 0.9515886369574873,
        "SOG_variation_boat2": 1.0239028853813417,
        "stability_score": 0.9445709434942722,
        "avg TWA boat1": -128.04586382393396,
        "avg TWA boat2": -123.588217630854
      }
    ]
  },
  {
    "run": "06_06_Run2",
    "intervals": [
      {
        "start_time": 1749218410.756,
        "end_time": 1749218503.055,
        "duration": 92.29900002479553,
        "boat1_name": "Gian Stragiotti",
        "boat2_name": "Karl Maeder",
        "avg_SOG_boat1": 20.628896103896103,
        "avg_SOG_boat2": 19.968831168831173,
        "SOG_variation_boat1": 0.9067093564181541,
        "SOG_variation_boat2": 0.8346519750535675,
        "stability_score": 0.942833736864102,
        "avg TWA boat1": 58.62945670995671,
        "avg TWA boat2": 59.69786023835319
      },
      {
        "start_time": 1749218683.072,
        "end_time": 1749218765.544,
        "duration": 82.47199988365173,
        "boat1_name": "Gian Stragiotti",
        "boat2_name": "Karl Maeder",
        "avg_SOG_boat1": 23.919733656174333,
        "avg_SOG_boat2": 23.06162227602906,
        "SOG_variation_boat1": 0.7730681426739846,
        "SOG_variation_boat2": 0.6780126271731283,
        "stability_score": 0.9560185231895253,
        "avg TWA boat1": -127.43249878934625,
        "avg TWA boat2": -127.43249878934625
      }
    ]
  }
]
```

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        "avg TWA boat2": -123.07302791262136
    }
]
},
{
  "run": "06_06_Run3",
  "intervals": [
    {
      "start_time": 1749219083.073,
      "end_time": 1749219175.858,
      "duration": 92.7850008583069,
      "boat1_name": "Gian Stragiotti",
      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 21.07330462863294,
      "avg_SOG_boat2": 20.33552206673843,
      "SOG_variation_boat1": 0.5395739407063026,
      "SOG_variation_boat2": 0.759244585294602,
      "stability_score": 0.9601994092956085,
      "avg TWA boat1": 51.75169214208827,
      "avg TWA boat2": 52.47970010787487
    },
    {
      "start_time": 1749219290.16,
      "end_time": 1749219362.356,
      "duration": 72.19599986076355,
      "boat1_name": "Gian Stragiotti",
      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 25.6195020746888,
      "avg_SOG_boat2": 24.885200553250346,
      "SOG_variation_boat1": 0.981529574563911,
      "SOG_variation_boat2": 0.776018360435992,
      "stability_score": 0.9448976503038875,
      "avg TWA boat1": -142.6102766251729,
      "avg TWA boat2": -139.40070914127423
    }
  ]
},
{
  "run": "06_06_Run4",
  "intervals": [
    {
      "start_time": 1749219592.657,
      "end_time": 1749219677.167,
      "duration": 84.50999999046326,
      "boat1_name": "Gian Stragiotti",
      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 20.83286052009456,
      "avg_SOG_boat2": 19.755082742316784,
      "SOG_variation_boat1": 0.7534429671731548,
      "SOG_variation_boat2": 0.7582392748198518,
      "stability_score": 0.9520012801147253,
      "avg TWA boat1": 52.84302718676123,
      "avg TWA boat2": 52.42702718676123
    },
    {
      "start_time": 1749219846.957,
      "end_time": 1749219914.956,
      "duration": 67.99900007247925,
      "boat1_name": "Gian Stragiotti",
      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 25.617180616740086,
      "avg_SOG_boat2": 25.13994126284875,
      "SOG_variation_boat1": 1.3801262659541982,
    }
  ]
}

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    "SOG_variation_boat2": 0.9780935821118564,
    "stability_score": 0.9348486932857036,
    "avg TWA boat1": -150.10865638766518,
    "avg TWA boat2": -149.47769852941175
  },
],
{
  "run": "06_06_Run5",
  "intervals": [
    {
      "start_time": 1749220725.36,
      "end_time": 1749220816.453,
      "duration": 91.09300017356873,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.34923245614035,
      "avg_SOG_boat2": 21.44890350877193,
      "SOG_variation_boat1": 0.6491567296316149,
      "SOG_variation_boat2": 0.5989002943547739,
      "stability_score": 0.9486767557895613,
      "avg TWA boat1": 49.54131907894737,
      "avg TWA boat2": 49.005721978021974
    },
    {
      "start_time": 1749220928.762,
      "end_time": 1749220980.961,
      "duration": 52.198999881744385,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 26.460038240917783,
      "avg_SOG_boat2": 26.744741873804973,
      "SOG_variation_boat1": 0.523828375631949,
      "SOG_variation_boat2": 0.6701532965718072,
      "stability_score": 0.9515073328781375,
      "avg TWA boat1": -153.27797705544933,
      "avg TWA boat2": -152.50175287356325
    }
  ]
},
{
  "run": "06_06_Run6",
  "intervals": [
    {
      "start_time": 1749221346.76,
      "end_time": 1749221428.253,
      "duration": 81.49300003051758,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.653553921568626,
      "avg_SOG_boat2": 22.263970588235296,
      "SOG_variation_boat1": 0.5949168046465491,
      "SOG_variation_boat2": 0.5117523549076435,
      "stability_score": 0.9565886361712643,
      "avg TWA boat1": 46.193330882352946,
      "avg TWA boat2": 45.99814619164619
    },
    {
      "start_time": 1749221540.453,
      "end_time": 1749221605.653,
      "duration": 65.20000004768372,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.653553921568626,
      "avg_SOG_boat2": 22.263970588235296,
      "SOG_variation_boat1": 0.5949168046465491,
      "SOG_variation_boat2": 0.5117523549076435,
      "stability_score": 0.9565886361712643,
      "avg TWA boat1": 46.193330882352946,
      "avg TWA boat2": 45.99814619164619
    }
  ]
}
]

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    "avg_SOG_boat1": 26.85574272588055,
    "avg_SOG_boat2": 27.408882082695254,
    "SOG_variation_boat1": 1.0986682992914734,
    "SOG_variation_boat2": 1.023967745909577,
    "stability_score": 0.9302256372484383,
    "avg TWA boat1": -144.64003675344563,
    "avg TWA boat2": -144.91828220858895
  }
],
},
{
  "run": "06_06_Run7",
  "intervals": [
    {
      "start_time": 1749221868.454,
      "end_time": 1749221955.561,
      "duration": 87.10700011253357,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.353440366972475,
      "avg_SOG_boat2": 21.582110091743118,
      "SOG_variation_boat1": 0.8288911152500027,
      "SOG_variation_boat2": 0.6998121097937636,
      "stability_score": 0.9477594291893645,
      "avg TWA boat1": 48.533939220183484,
      "avg TWA boat2": 47.087543577981656
    },
    {
      "start_time": 1749222059.852,
      "end_time": 1749222114.565,
      "duration": 54.71300005912781,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 27.10748175182482,
      "avg_SOG_boat2": 27.978284671532844,
      "SOG_variation_boat1": 0.6197235404410711,
      "SOG_variation_boat2": 0.691805770513382,
      "stability_score": 0.9501800864640243,
      "avg TWA boat1": -149.8113010948905,
      "avg TWA boat2": -149.2366697080292
    }
  ]
},
{
  "run": "06_06_Run8",
  "intervals": [
    {
      "start_time": 1749222367.653,
      "end_time": 1749222438.362,
      "duration": 70.70899987220764,
      "boat1_name": "Karl Maeder",
      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 22.16511299435028,
      "avg_SOG_boat2": 22.5840395480226,
      "SOG_variation_boat1": 0.5973637167822781,
      "SOG_variation_boat2": 0.7144593181179898,
      "stability_score": 0.9560608376291224,
      "avg TWA boat1": 51.31460310734464,
      "avg TWA boat2": 51.027292786421505
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    {
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    "duration": 48.89400005340576,
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    "avg_SOG_boat1": 27.94816326530612,
    "avg_SOG_boat2": 28.096938775510203,
    "SOG_variation_boat1": 0.9708463481811307,
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    "stability_score": 0.9417601672988045,
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      "avg_SOG_boat1": 21.963178807947017,
      "avg_SOG_boat2": 21.839205298013244,
      "SOG_variation_boat1": 0.8401531144879028,
      "SOG_variation_boat2": 0.9675089860916953,
      "stability_score": 0.9441910987537523,
      "avg TWA boat1": 49.23554966887417,
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    {
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      "avg_SOG_boat1": 28.043661971830986,
      "avg_SOG_boat2": 27.43556338028169,
      "SOG_variation_boat1": 0.543580758248723,
      "SOG_variation_boat2": 0.5307171609912046,
      "stability_score": 0.955246951016757,
      "avg TWA boat1": -144.11071302816904,
      "avg TWA boat2": -143.36808112874778
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 22.64335347432024,
      "avg_SOG_boat2": 23.47084592145015,
      "SOG_variation_boat1": 0.6773912708829328,
      "SOG_variation_boat2": 0.5706212956611496,
      "stability_score": 0.9528902891742502,
      "avg TWA boat1": 45.05258157099698,
      "avg TWA boat2": 43.74408623298034
    }
  ]
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            "duration": 77.0,
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            "boat2_name": "Karl Maeder",
            "avg_SOG_boat1": 22.865239948119324,
            "avg_SOG_boat2": 22.553696498054478,
            "SOG_variation_boat1": 0.6730898230419137,
            "SOG_variation_boat2": 0.5341299090249424,
            "stability_score": 0.9626417930937567,
            "avg TWA boat1": 47.751932555123226,
            "avg TWA boat2": 48.71577431906615
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          {
            "start_time": 1749297691.657,
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            "duration": 60.401999950408936,
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            "boat2_name": "Karl Maeder",
            "avg_SOG_boat1": 27.090413223140498,
            "avg_SOG_boat2": 25.958512396694214,
            "SOG_variation_boat1": 0.7559306319727097,
            "SOG_variation_boat2": 1.2134924839232093,
            "stability_score": 0.9307430667813382,
            "avg TWA boat1": -150.27019008264463,
            "avg TWA boat2": -149.7948658940397
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            "duration": 72.52300000190735,
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            "boat2_name": "SenseBoard",
            "avg_SOG_boat1": 22.341046831955925,
            "avg_SOG_boat2": 22.145867768595043,
            "SOG_variation_boat1": 0.7727575382849117,
            "SOG_variation_boat2": 0.6513461956814279,
            "stability_score": 0.9489410457998966,
            "avg TWA boat1": 44.143546831955916,
            "avg TWA boat2": 44.80527685950413
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          {
            "start_time": 1749298667.96,
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            "duration": 52.3989999294281,
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            "boat2_name": "SenseBoard",
            "avg_SOG_boat1": 26.654857142857143,
            "avg_SOG_boat2": 25.69504761904762,
            "SOG_variation_boat1": 1.2571172298369353,
            "SOG_variation_boat2": 0.8027471009187404,
            "stability_score": 0.9320480452067217,
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    ]
  }
}

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            "boat2_name": "SenseBoard",
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            "avg_SOG_boat2": 22.121699544764795,
            "SOG_variation_boat1": 0.38275739274376647,
            "SOG_variation_boat2": 0.39683339377653915,
            "stability_score": 0.9581750639895472,
            "avg TWA boat1": 43.93832928679817,
            "avg TWA boat2": 44.40660638297872
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    ]
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            "duration": 70.49300003051758,
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            "avg_SOG_boat1": 21.76416430594901,
            "avg_SOG_boat2": 22.08541076487252,
            "SOG_variation_boat1": 0.8063254863803692,
            "SOG_variation_boat2": 0.7315384845906225,
            "stability_score": 0.9533161420278544,
            "avg TWA boat1": 36.796161473087814,
            "avg TWA boat2": 36.84956170212766
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            "avg_SOG_boat2": 26.163423423423424,
            "SOG_variation_boat1": 0.7892196125532588,
            "SOG_variation_boat2": 0.7432821829032848,
            "stability_score": 0.9466301754487026,
            "avg TWA boat1": -146.36544864864862,
            "avg TWA boat2": -143.13807387387385
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    "SOG_variation_boat1": 0.763288288371628,
    "SOG_variation_boat2": 0.8325562301099382,
    "stability_score": 0.9460546867186711,
    "avg TWA boat1": 53.17682241630276,
    "avg TWA boat2": 53.058619533527704
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    "avg_SOG_boat2": 26.94733475479744,
    "SOG_variation_boat1": 0.552702055268001,
    "SOG_variation_boat2": 0.7170231201250045,
    "stability_score": 0.954540626198833,
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    "avg TWA boat2": -142.79171367521366
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      "avg_SOG_boat2": 21.927827191867852,
      "SOG_variation_boat1": 0.9749568119743653,
      "SOG_variation_boat2": 0.6769567665206051,
      "stability_score": 0.936863343249288,
      "avg TWA boat1": 48.04379923761118,
      "avg TWA boat2": 47.43928589580686
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    {
      "start_time": 1749301411.157,
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 26.52573099415205,
      "avg_SOG_boat2": 26.46315789473684,
      "SOG_variation_boat1": 0.7776923381434446,
      "SOG_variation_boat2": 0.870090786627283,
      "stability_score": 0.9375154012460885,
      "avg TWA boat1": -144.84534502923975,
      "avg TWA boat2": -143.29122460937498
    }
  ]
},
{
  "run": "07_06_Run8",
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  "avg_SOG_boat1": 22.51740947075209,
  "avg_SOG_boat2": 22.759610027855153,
  "SOG_variation_boat1": 0.5650099437734697,
  "SOG_variation_boat2": 0.5532819423058453,
  "stability_score": 0.9577400650074185,
  "avg TWA boat1": 41.50411699164346,
  "avg TWA boat2": 41.46591086350975
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  "boat2_name": "SenseBoard",
  "avg_SOG_boat1": 27.513175675675676,
  "avg_SOG_boat2": 27.88800675675676,
  "SOG_variation_boat1": 0.7974125136783207,
  "SOG_variation_boat2": 0.8771636029942704,
  "stability_score": 0.9418801605770067,
  "avg TWA boat1": -148.94989695945947,
  "avg TWA boat2": -147.68387817258883
}
],
},
{
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      "avg_SOG_boat1": 22.451685393258426,
      "avg_SOG_boat2": 22.51376404494382,
      "SOG_variation_boat1": 0.6113759556207927,
      "SOG_variation_boat2": 0.4296093020459766,
      "stability_score": 0.9590127159886065,
      "avg TWA boat1": 37.68364325842697,
      "avg TWA boat2": 37.56341011235955
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    {
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      "duration": 55.09500002861023,
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      "boat2_name": "SenseBoard",
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      "avg_SOG_boat2": 28.581702898550724,
      "SOG_variation_boat1": 0.6873258455105818,
      "SOG_variation_boat2": 0.7982344393099536,
      "stability_score": 0.9533717668789307,
      "avg TWA boat1": -146.85178442028985,
      "avg TWA boat2": -146.13901272727273
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      "avg_SOG_boat2": 22.536926605504586,
      "SOG_variation_boat1": 0.5375207987510348,
      "SOG_variation_boat2": 0.512500289349613,
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      "avg TWA boat1": 44.49741513761468,
      "avg TWA boat2": 45.28188275862069
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      "boat2_name": "Karl Maeder",
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      "avg_SOG_boat2": 27.05921052631579,
      "SOG_variation_boat1": 1.255931169070074,
      "SOG_variation_boat2": 1.0528825912284492,
      "stability_score": 0.9093831701042365,
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      "avg TWA boat2": -141.69573355263157
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      "avg_SOG_boat2": 23.48806179775281,
      "SOG_variation_boat1": 0.5511177367947175,
      "SOG_variation_boat2": 0.4551139720333162,
      "stability_score": 0.959711811120633,
      "avg TWA boat1": 53.392522471910105,
      "avg TWA boat2": 52.8742323943662
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      "avg_SOG_boat2": 27.09448160535117,
      "SOG_variation_boat1": 0.5345879988876501,
      "SOG_variation_boat2": 0.5365560962142617,
      "stability_score": 0.957751704953281,
      "avg TWA boat1": -142.05264046822742,
      "avg TWA boat2": -141.84622780569515
    }
  ]
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{
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      "avg_SOG_boat1": 22.504330708661417,
      "avg_SOG_boat2": 22.613123359580047,
      "SOG_variation_boat1": 0.7114935048469836,
      "SOG_variation_boat2": 0.640023782413945,
      "stability_score": 0.9513197904882225,
      "avg TWA boat1": 52.59047244094488,
      "avg TWA boat2": 52.05301706036745
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    {
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      "end_time": 1749476288.852,
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      "avg_SOG_boat2": 25.887630662020907,
      "SOG_variation_boat1": 0.6930163939445706,
      "SOG_variation_boat2": 1.422606178127307,
      "stability_score": 0.9392180986971629,
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      "avg TWA boat2": -143.76494230769228
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      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 24.031593406593405,
      "avg_SOG_boat2": 23.13186813186813,
      "SOG_variation_boat1": 0.31142910536734647,
      "SOG_variation_boat2": 0.47849145888594846,
      "stability_score": 0.9558004364098289,
      "avg TWA boat1": 49.42057142857143,
      "avg TWA boat2": 50.272241758241755
    },
    {
      "start_time": 1749470547.954,
      "end_time": 1749470581.265,
      "duration": 33.31100010871887,
      "boat1_name": "Gian Stragiotti",
      "boat2_name": "Karl Maeder",
      "avg_SOG_boat1": 26.06077844311377,
      "avg_SOG_boat2": 25.03832335329341,
      "SOG_variation_boat1": 0.6201234925080098,
      "SOG_variation_boat2": 0.5155523032738231,
    }
  ]
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        "stability_score": 0.9545236042056817,
        "avg TWA boat1": -135.47067065868265,
        "avg TWA boat2": -135.0561407185629
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],
},
{
    "run": "09_06_Run4",
    "intervals": [
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            "end_time": 1749472186.25,
            "duration": 72.89000010490417,
            "boat1_name": "Karl Maeder",
            "boat2_name": "SenseBoard",
            "avg_SOG_boat1": 23.739589041095893,
            "avg_SOG_boat2": 24.39876712328767,
            "SOG_variation_boat1": 0.3369065207451699,
            "SOG_variation_boat2": 0.4116427833510405,
            "stability_score": 0.9690978635611063,
            "avg TWA boat1": 49.43278493150686,
            "avg TWA boat2": 49.112343406593396
        },
        {
            "start_time": 1749472264.157,
            "end_time": 1749472316.851,
            "duration": 52.694000005722046,
            "boat1_name": "Karl Maeder",
            "boat2_name": "SenseBoard",
            "avg_SOG_boat1": 27.548295454545453,
            "avg_SOG_boat2": 28.196590909090908,
            "SOG_variation_boat1": 0.8662756614664463,
            "SOG_variation_boat2": 0.51753661080402,
            "stability_score": 0.9557784420097398,
            "avg TWA boat1": -134.95101893939395,
            "avg TWA boat2": -134.97217077798862
        }
    ]
},
{
    "run": "09_06_Run5",
    "intervals": [
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            "end_time": 1749472738.244,
            "duration": 79.48699998855591,
            "boat1_name": "Karl Maeder",
            "boat2_name": "SenseBoard",
            "avg_SOG_boat1": 22.624623115577887,
            "avg_SOG_boat2": 22.701381909547738,
            "SOG_variation_boat1": 0.4890979849800434,
            "SOG_variation_boat2": 0.7991886450892677,
            "stability_score": 0.9422971128323023,
            "avg TWA boat1": 49.11340829145729,
            "avg TWA boat2": 48.643725786163515
        }
    ]
},
{
    "run": "09_06_Run6",
    "intervals": [
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            "start_time": 1749473147.56,

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    "end_time": 1749473225.452,
    "duration": 77.89199995994568,
    "boat1_name": "Karl Maeder",
    "boat2_name": "SenseBoard",
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    "avg_SOG_boat2": 23.61628205128205,
    "SOG_variation_boat1": 0.500138620065607,
    "SOG_variation_boat2": 0.5087213929516048,
    "stability_score": 0.9607251552424718,
    "avg TWA boat1": 48.112110256410254,
    "avg TWA boat2": 47.654192802056556
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  {
    "start_time": 1749473311.452,
    "end_time": 1749473367.161,
    "duration": 55.70900011062622,
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    "boat2_name": "SenseBoard",
    "avg_SOG_boat1": 26.98494623655914,
    "avg_SOG_boat2": 27.48405017921147,
    "SOG_variation_boat1": 1.0181772959956257,
    "SOG_variation_boat2": 1.084713471498955,
    "stability_score": 0.9354892701167343,
    "avg TWA boat1": -137.93177956989246,
    "avg TWA boat2": -138.2887562724014
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]
},
{
  "run": "09_06_Run7",
  "intervals": [
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      "avg_SOG_boat2": 22.624334600760456,
      "SOG_variation_boat1": 0.55419341309436,
      "SOG_variation_boat2": 0.46854453285766895,
      "stability_score": 0.9616028973297371,
      "avg TWA boat1": 49.07139290240811,
      "avg TWA boat2": 47.72001143583227
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      "avg_SOG_boat1": 27.416063348416294,
      "avg_SOG_boat2": 27.467194570135746,
      "SOG_variation_boat1": 0.40382510702817087,
      "SOG_variation_boat2": 0.4331352798761579,
      "stability_score": 0.9696070638905365,
      "avg TWA boat1": -141.94795022624433,
      "avg TWA boat2": -141.71919457013576
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    "avg_SOG_boat2": 23.87938718662953,
    "SOG_variation_boat1": 0.8609428983227672,
    "SOG_variation_boat2": 0.5482505845267425,
    "stability_score": 0.950397742445535,
    "avg TWA boat1": 57.10078133704736,
    "avg TWA boat2": 56.80302510460251
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  {
    "start_time": 1749474488.96,
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    "boat2_name": "SenseBoard",
    "avg_SOG_boat1": 27.029557522123895,
    "avg_SOG_boat2": 28.141769911504422,
    "SOG_variation_boat1": 0.7642689797248976,
    "SOG_variation_boat2": 0.6949083184700647,
    "stability_score": 0.9450993018055329,
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      "avg_SOG_boat1": 22.304591836734694,
      "avg_SOG_boat2": 22.711096938775512,
      "SOG_variation_boat1": 0.5388643625825527,
      "SOG_variation_boat2": 0.700258533385619,
      "stability_score": 0.9551417096833701,
      "avg TWA boat1": 41.73807142857142,
      "avg TWA boat2": 41.39825510204082
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    {
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      "duration": 63.805999994277954,
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 26.247730829420973,
      "avg_SOG_boat2": 26.887323943661972,
      "SOG_variation_boat1": 1.1609599109764523,
      "SOG_variation_boat2": 1.1274901551980114,
      "stability_score": 0.9418046096623041,
      "avg TWA boat1": -141.24467605633802,
      "avg TWA boat2": -141.60166040688577
    }
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.69384800965018,
      "avg_SOG_boat2": 21.486731001206273,
      "SOG_variation_boat1": 0.730196374263099,
      "SOG_variation_boat2": 0.40116683828754984,
      "stability_score": 0.9535533590590728,
      "avg TWA boat1": 52.206868516284686,
      "avg TWA boat2": 52.77614371980676
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    {
      "start_time": 1749558673.154,
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 26.096612903225807,
      "avg_SOG_boat2": 25.48983870967742,
      "SOG_variation_boat1": 0.35652896547939333,
      "SOG_variation_boat2": 0.40856339168578976,
      "stability_score": 0.971010158016123,
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      "avg TWA boat2": -125.65837702265374
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      "avg_SOG_boat2": 23.178994845360826,
      "SOG_variation_boat1": 0.41995201398162524,
      "SOG_variation_boat2": 0.5416433965310141,
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    "avg_SOG_boat2": 22.068200836820083,
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    "stability_score": 0.9559728909986651,
    "avg TWA boat1": 52.640885634588564,
    "avg TWA boat2": 52.14431188811189
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    "boat2_name": "SenseBoard",
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    "avg_SOG_boat2": 25.211059190031154,
    "SOG_variation_boat1": 0.7404155335022017,
    "SOG_variation_boat2": 0.8280114326073742,
    "stability_score": 0.9504921939310214,
    "avg TWA boat1": -127.93700155763241,
    "avg TWA boat2": -127.51544461778471
  }
]
},
{
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 21.994059405940597,
      "avg_SOG_boat2": 21.990594059405943,
      "SOG_variation_boat1": 0.7388925411024234,
      "SOG_variation_boat2": 0.5778742770822772,
      "stability_score": 0.953204234730681,
      "avg TWA boat1": 49.97390841584159,
      "avg TWA boat2": 50.850877171215885
    },
    {
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 27.64554794520548,
      "avg_SOG_boat2": 26.64315068493151,
      "SOG_variation_boat1": 0.5011965522379294,
      "SOG_variation_boat2": 0.6705423967953442,
      "stability_score": 0.9601047261275962,
      "avg TWA boat1": -133.5486917808219,
      "avg TWA boat2": -132.0653859348199
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      "avg_SOG_boat2": 25.211059190031154,
      "SOG_variation_boat1": 0.7404155335022017,
      "SOG_variation_boat2": 0.8280114326073742,
      "stability_score": 0.9504921939310214,
      "avg TWA boat1": -127.93700155763241,
      "avg TWA boat2": -127.51544461778471
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    "avg_SOG_boat2": 25.462637362637363,
    "SOG_variation_boat1": 0.39522414743314455,
    "SOG_variation_boat2": 0.4166932744286133,
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    "avg TWA boat2": -135.28631918238995
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  {
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    "boat2_name": "SenseBoard",
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    "avg_SOG_boat2": 23.263812600969302,
    "SOG_variation_boat1": 0.2507966821924402,
    "SOG_variation_boat2": 0.35116404270583057,
    "stability_score": 0.9659327760725448,
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      "avg_SOG_boat2": 22.019749652294852,
      "SOG_variation_boat1": 0.5572462632815723,
      "SOG_variation_boat2": 0.5293075769860968,
      "stability_score": 0.9567273144399103,
      "avg TWA boat1": 53.3207385252730185,
      "avg TWA boat2": 53.22120891364903
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    {
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      "avg_SOG_boat2": 26.611033274956217,
      "SOG_variation_boat1": 0.632341115381163,
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      "stability_score": 0.9509252355692811,
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    "avg_SOG_boat2": 23.516235632183907,
    "SOG_variation_boat1": 0.5169831351801489,
    "SOG_variation_boat2": 0.45972550045053184,
    "stability_score": 0.9537322462401603,
    "avg TWA boat1": 51.064441091954016,
    "avg TWA boat2": 52.42953025936599
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  {
    "start_time": 1749561358.755,
    "end_time": 1749561410.344,
    "duration": 51.58899998664856,
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    "boat2_name": "SenseBoard",
    "avg_SOG_boat1": 27.32533849129594,
    "avg_SOG_boat2": 26.817601547388783,
    "SOG_variation_boat1": 0.42939037767735944,
    "SOG_variation_boat2": 0.7169187756296483,
    "stability_score": 0.9594448151418715,
    "avg TWA boat1": -139.8555744680851,
    "avg TWA boat2": -138.83477131782945
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      "boat2_name": "SenseBoard",
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      "avg_SOG_boat2": 22.69923566878981,
      "SOG_variation_boat1": 0.46145018499878054,
      "SOG_variation_boat2": 0.466122111914797,
      "stability_score": 0.9603083668306479,
      "avg TWA boat1": 52.410187261146504,
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    {
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      "boat2_name": "SenseBoard",
      "avg_SOG_boat1": 27.182752902155887,
      "avg_SOG_boat2": 27.47943615257048,
      "SOG_variation_boat1": 0.4829667284276853,
      "SOG_variation_boat2": 0.5229691114346436,
      "stability_score": 0.9584755488664407,
      "avg TWA boat1": -140.0589087893864,
      "avg TWA boat2": -141.00498172757474
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    "avg_SOG_boat2": 22.975102599179205,
    "SOG_variation_boat1": 0.5147323424896912,
    "SOG_variation_boat2": 0.371569915073537,
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    "avg TWA boat1": 46.911707250342,
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  {
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    "avg_SOG_boat2": 27.623679417122037,
    "SOG_variation_boat1": 0.5697516603888413,
    "SOG_variation_boat2": 0.5713860845549331,
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      "avg_SOG_boat2": 23.245157068062827,
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      "SOG_variation_boat2": 0.5096603874668506,
      "stability_score": 0.9598662905803237,
      "avg TWA boat1": 48.476879581151834,
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    {
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      "avg_SOG_boat2": 27.583450704225353,
      "SOG_variation_boat1": 0.6846555778656566,
      "SOG_variation_boat2": 0.48716224064681496,
      "stability_score": 0.9543604441750976,
      "avg TWA boat1": -142.28071830985917,
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]
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