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LAMPIRAN

Lampiran 1. Penentuan Skala model.

Penentuan Skala dilakukan untuk menghindari terjadinya ombak pada dinding tangka atau yang disebut *blockage effect* dimana ukuran model harus disesuaikan dengan ukuran tangki serta tinggi air dalam tangka dengan sarat model. Menurut harvald, penentuan lebar model (B_m) adalah sebagai berikut : $B_m < 1/10 B$ Tangki
Diketahui

$$\begin{aligned} B \text{ tangki} &= 4 \text{ m} \\ &= \frac{1}{10} \times 4 \text{ m} \\ &= 0,4 \text{ m} \end{aligned}$$

Maka lebar model yang digunakan supaya tidak menimbulkan *blockage effect* dan dapat digunakan untuk pengujian model di towing tank yaitu:

$$B_m < 0,4 \text{ m}$$

Berdasarkan perhitungan dari persamaan diatas, maka penentuan skala model kapal dapat ditentukan melalui table berikut:

| Bs (m) | Skala Bm (m) |
|---------------|---------------------|
| 4.5 | 1:10 0.45 |
| 4.5 | 1:15 0.30 |
| 4.5 | 1:20 0.23 |
| 4.5 | 1:25 0.18 |

Dari table diatas ukuran lebar model kapal maksimal yang memenuhi Kriteria yaitu 0,30 m sehingga skala yang digunakan untuk ukuran model kapal yaitu 1 : 15.

Lampiran 2. Trim Model.

Model 1 Stepped

| | |
|---------------|-------|
| <i>Trim 1</i> | 0,92° |
| <i>Trim 2</i> | 1,16° |
| <i>Trim 3</i> | 2,88° |

Model 2 Stepped

| | |
|---------------|-------|
| <i>Trim 1</i> | 1,05° |
| <i>Trim 2</i> | 1,55° |

| | |
|-------------------------------|-------|
| <i>Trim 3</i> | 2,94° |
| <i>Model 3 Stepped</i> | |
| <i>Trim 1</i> | 1,67° |
| <i>Trim 2</i> | 2,18° |
| <i>Trim 3</i> | 3,72° |

Lampiran 3. Kecepatan Model. *Model*

1 Stepped

| | |
|---------------|-----------|
| <i>Trim 1</i> | 2,169 m/s |
| <i>Trim 2</i> | 2,421 m/s |
| <i>Trim 3</i> | 4,348 m/s |

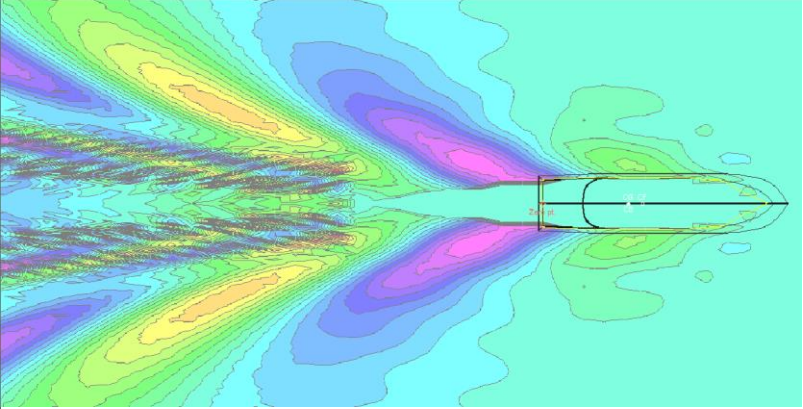
Model 2 Stepped

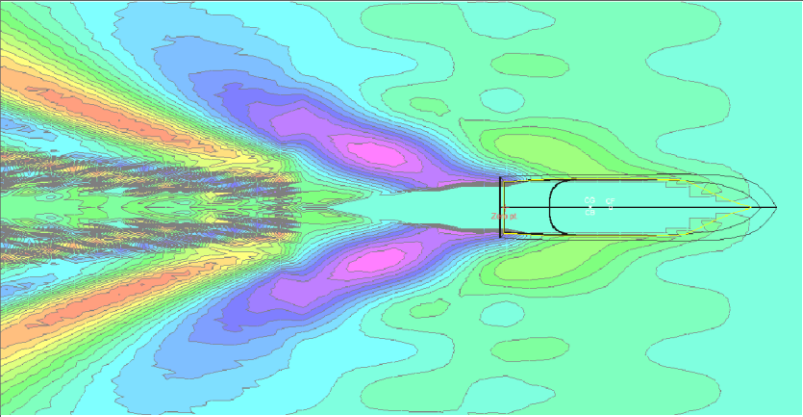
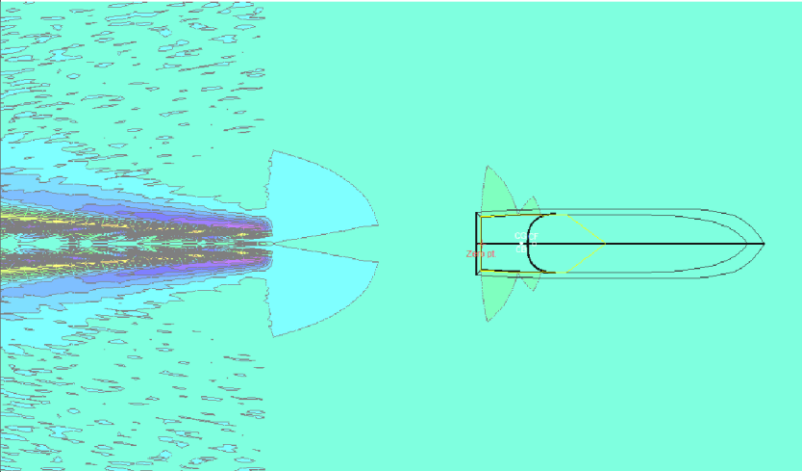
| | |
|---------------|-----------|
| <i>Trim 1</i> | 1,919 m/s |
| <i>Trim 2</i> | 2,439 m/s |
| <i>Trim 3</i> | 4,272 m/s |

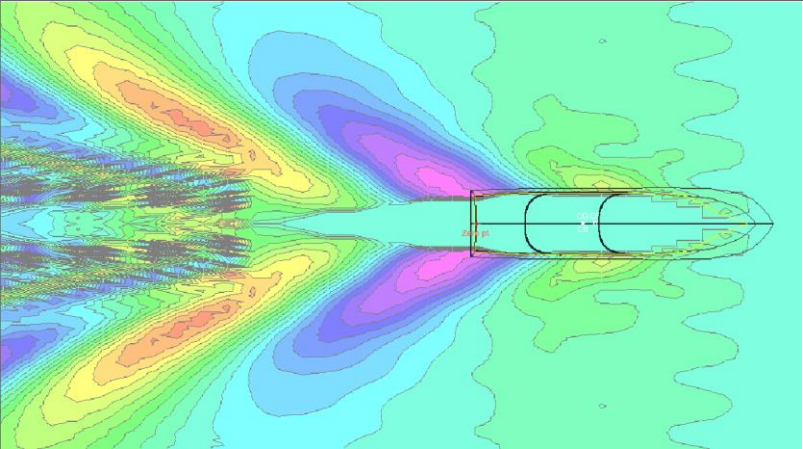
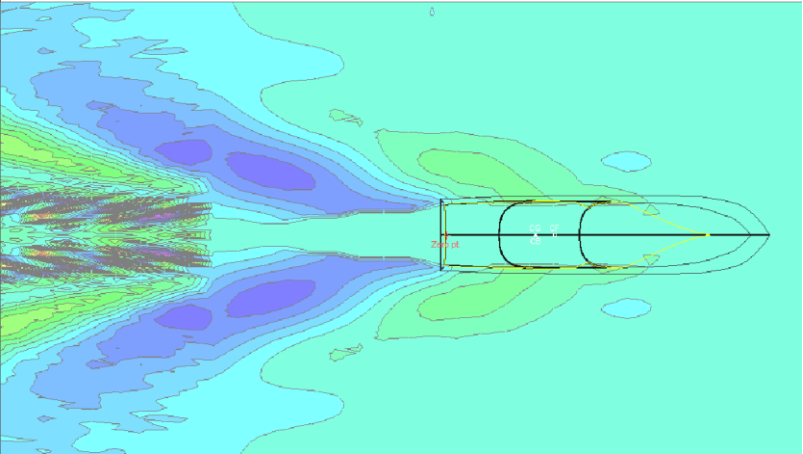
Model 3 Stepped

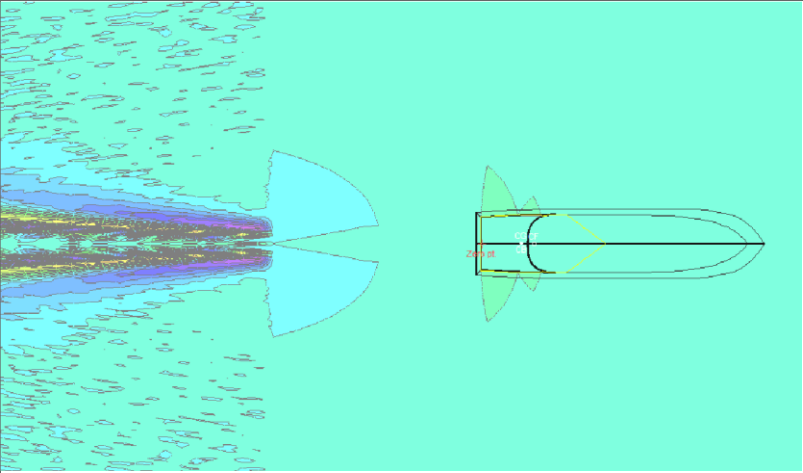
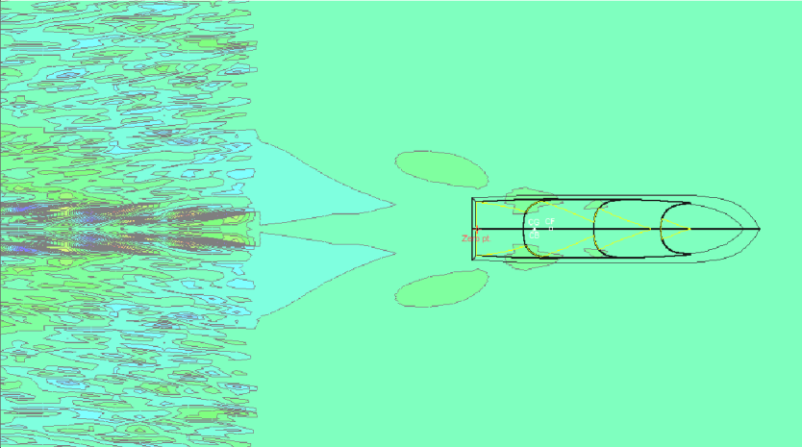
| | |
|---------------|-----------|
| <i>Trim 1</i> | 2,494 m/s |
| <i>Trim 2</i> | 2,833 m/s |
| <i>Trim 3</i> | 5,236 m/s |

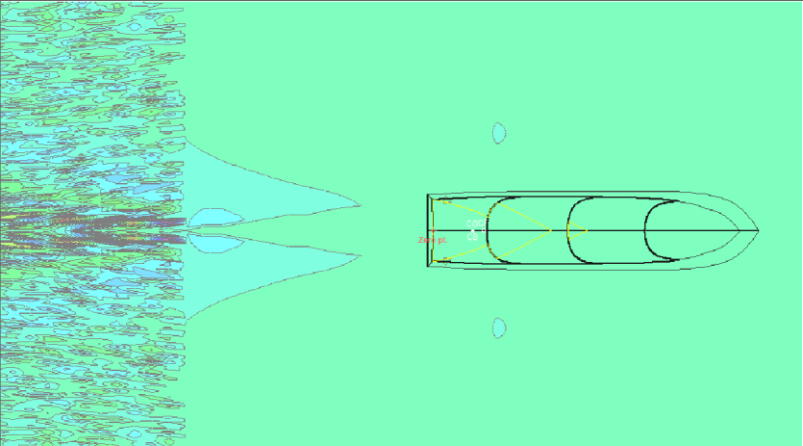
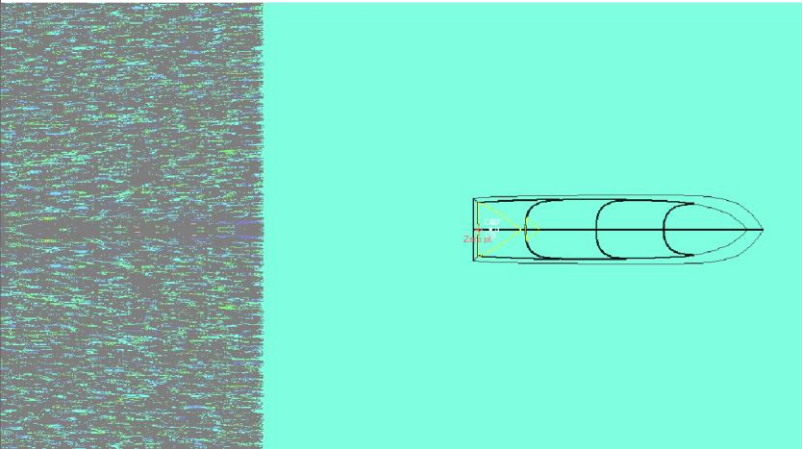
Lampiran 4. Kesimpulan dari Seluruh Pola Aliran

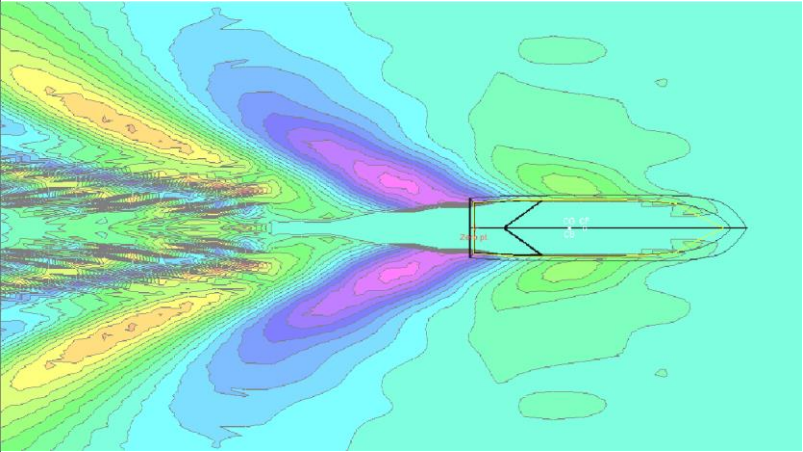
| Model | | | | Kecepatan (M/S) | Tahanan Total RT (N) | Pola Aliran |
|-------------------|-----------|-----------|--------|--------------------|----------------------------|---|
| Deadrise 5 | Stepped U | 1 stepped | Trim 1 | 2,169 | 10,56 |  |

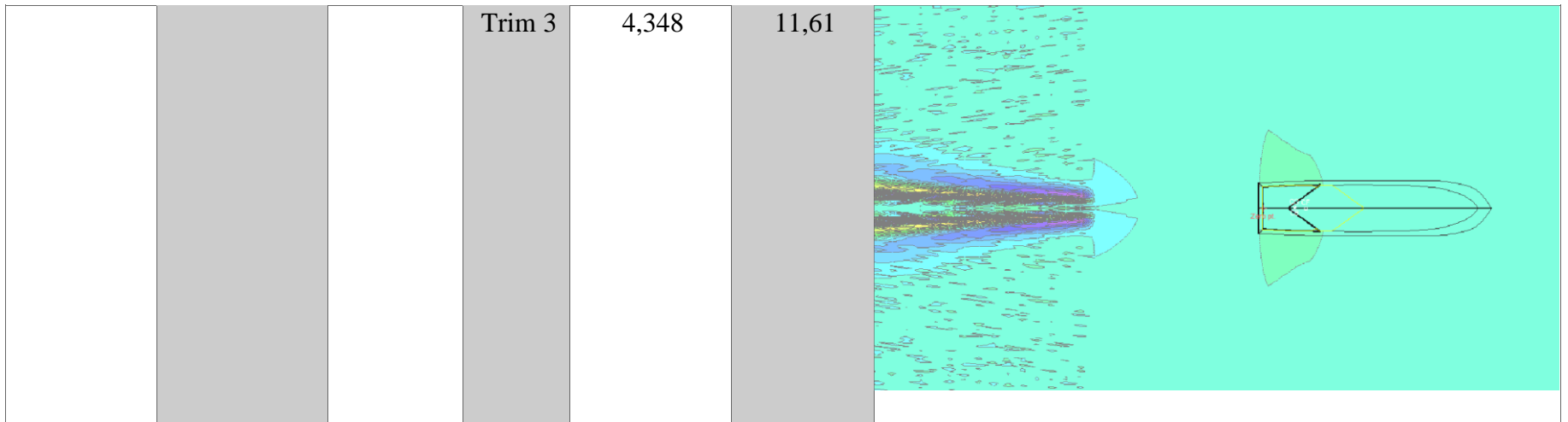
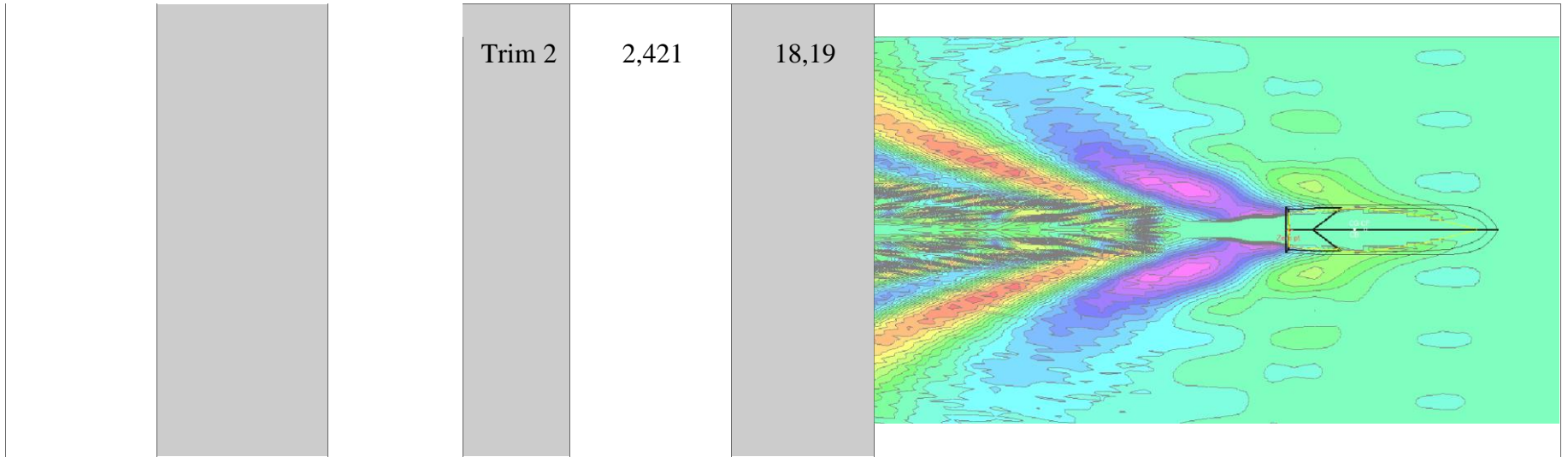
| | | | | | | |
|--|--|--|--------|-------|-------|--|
| | | | Trim 2 | 2,421 | 11,05 |  |
| | | | Trim 3 | 4,348 | 9,82 |  |

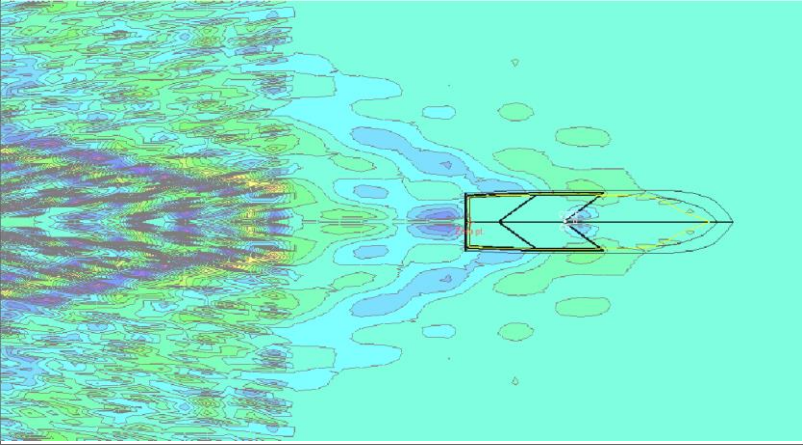
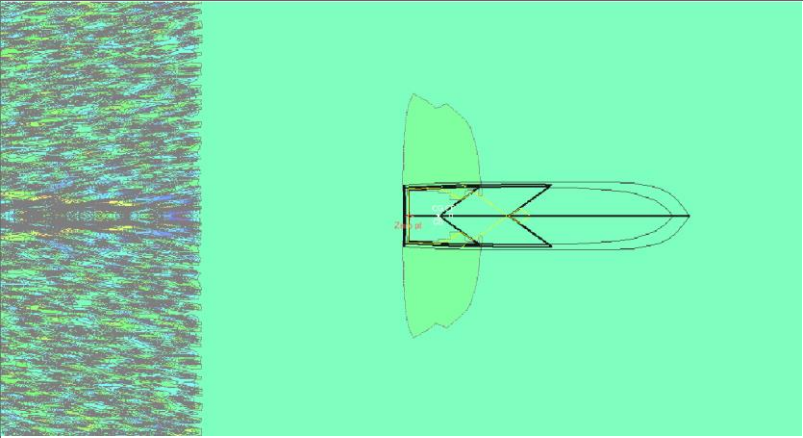
| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | 2 stepped | Trim 1 | 1,919 | 7,06 |  |
| | | | Trim 2 | 2,439 | 7,72 |  |

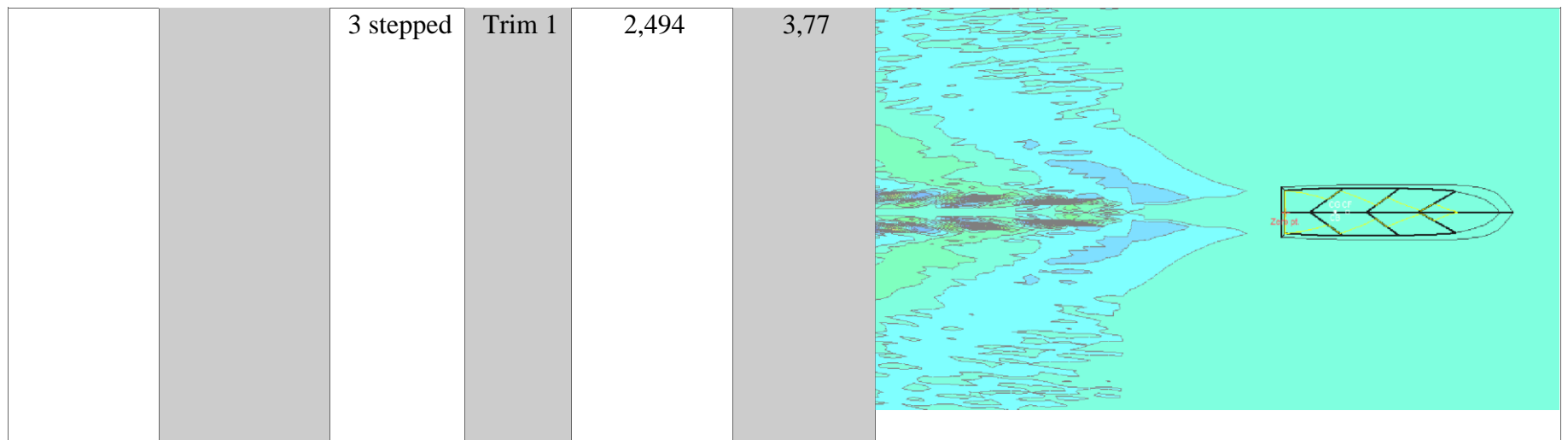
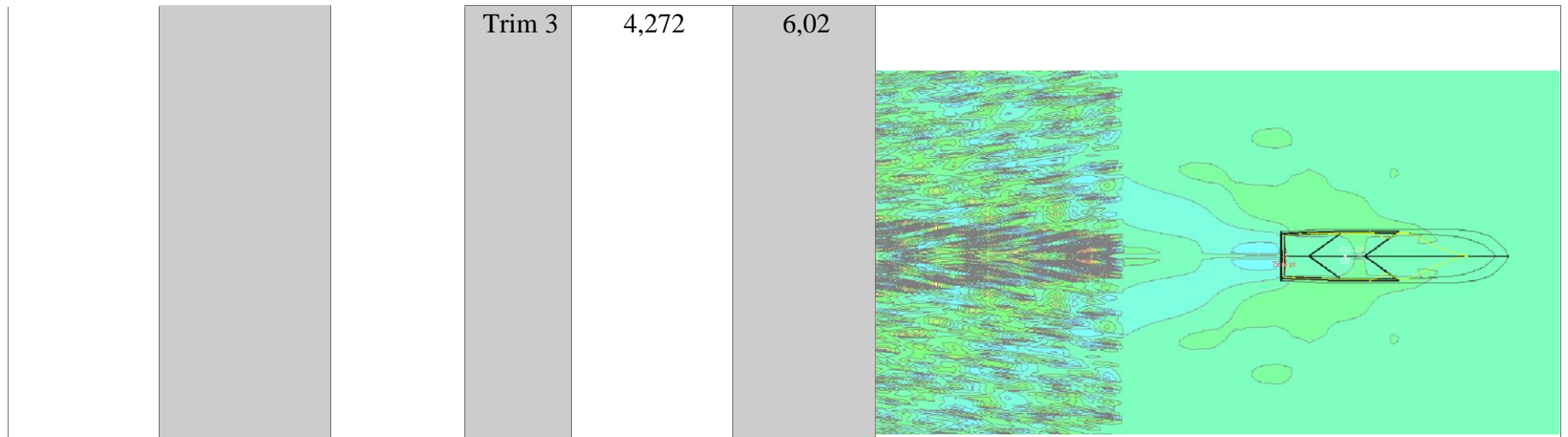
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|--|--|-----------|--------|-------|------|--|
| | | | Trim 3 | 4,272 | 5,01 |  |
| | | 3 stepped | Trim 1 | 2,494 | 2,15 |  |

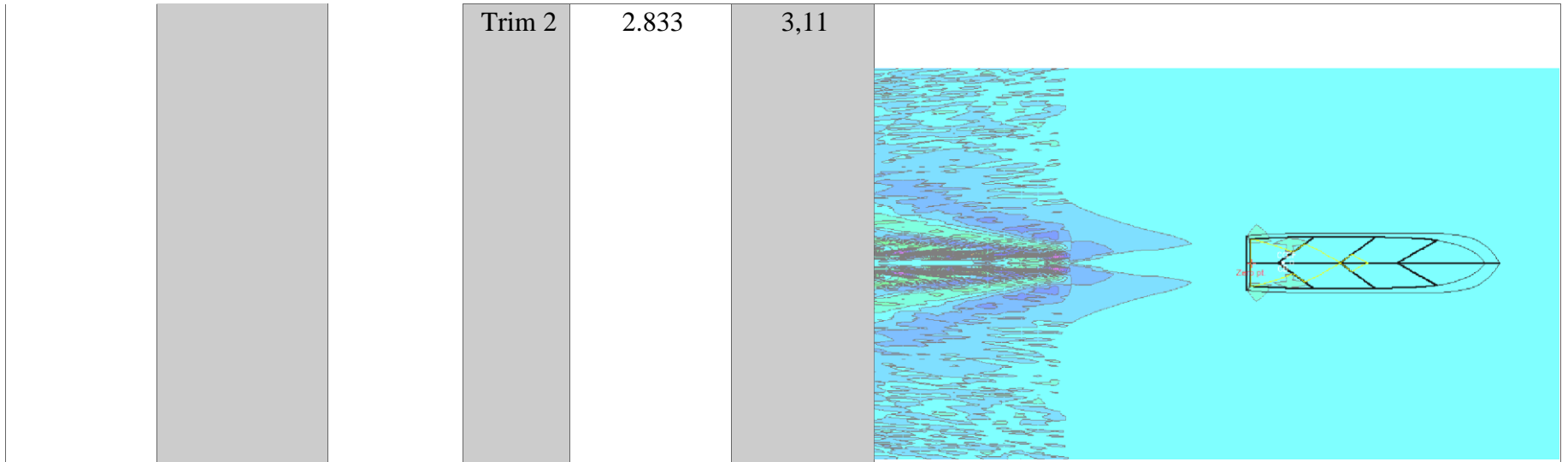
| | | | | | | |
|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,833 | 2,41 |  |
| | | | Trim 3 | 5,236 | 1,44 |  |

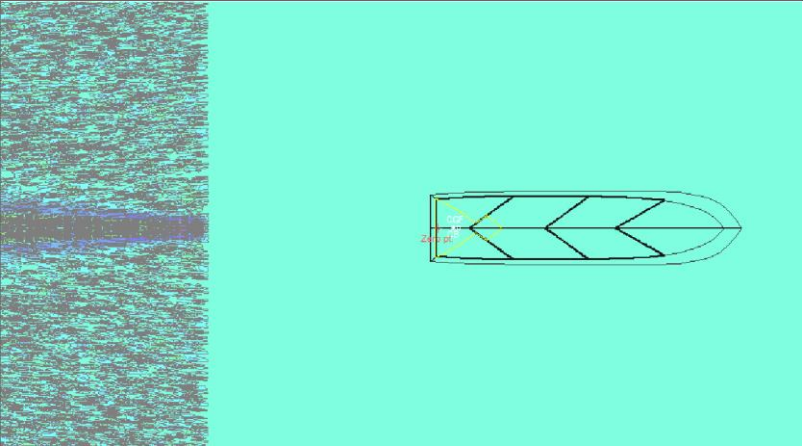
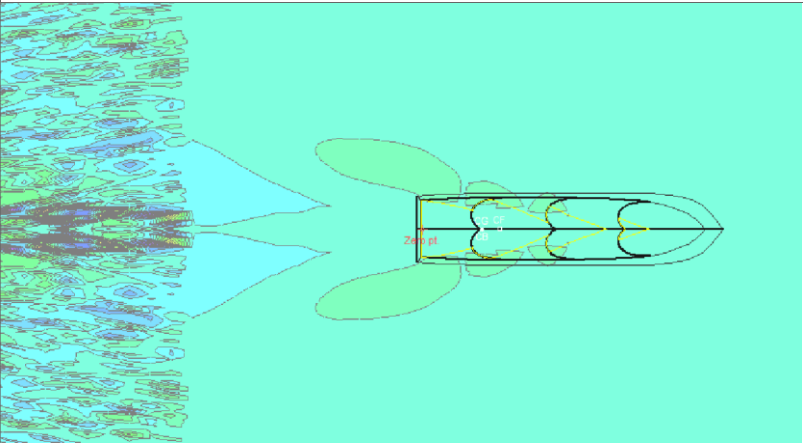
| | | | | | | |
|--|-----------|-----------|--------|-------|-------|---|
| | Stepped V | 1 stepped | Trim 1 | 2,169 | 21,36 |  |
|--|-----------|-----------|--------|-------|-------|---|



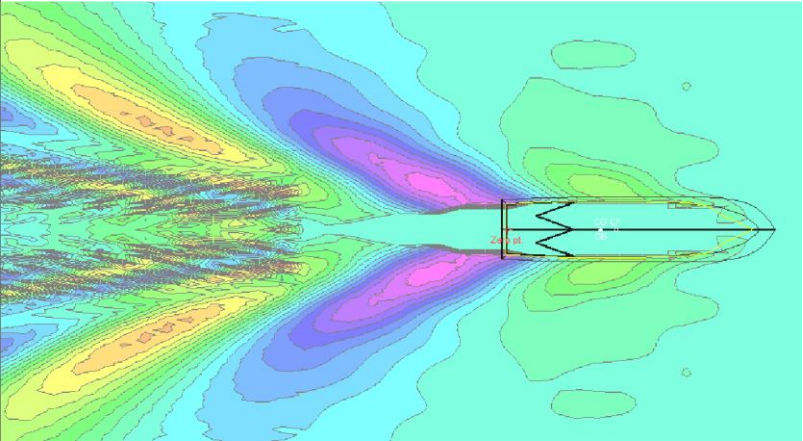
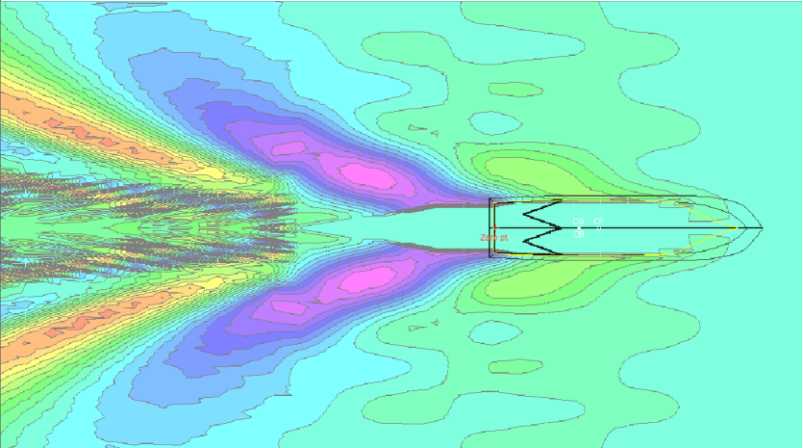
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|--|--|-----------|--------|-------|-------|--|
| | | 2 stepped | Trim 1 | 1,919 | 15,32 |  |
| | | | Trim 2 | 2,439 | 10,37 |  |

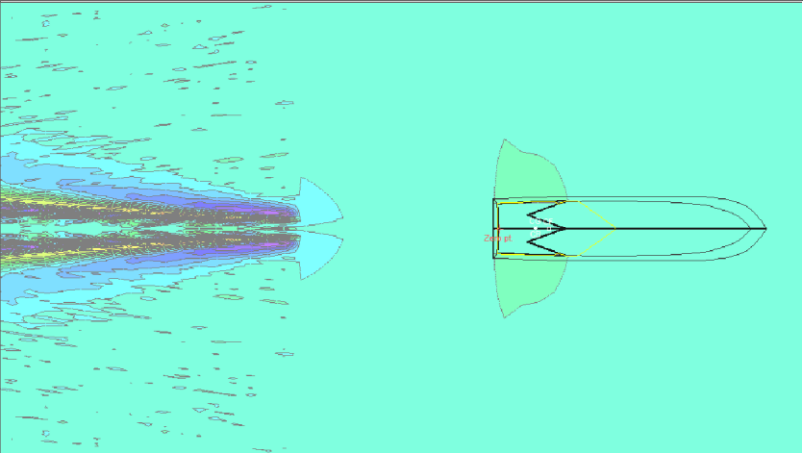
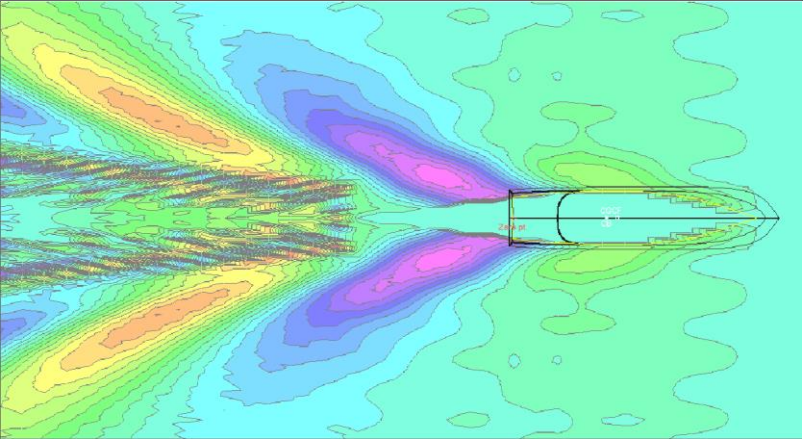


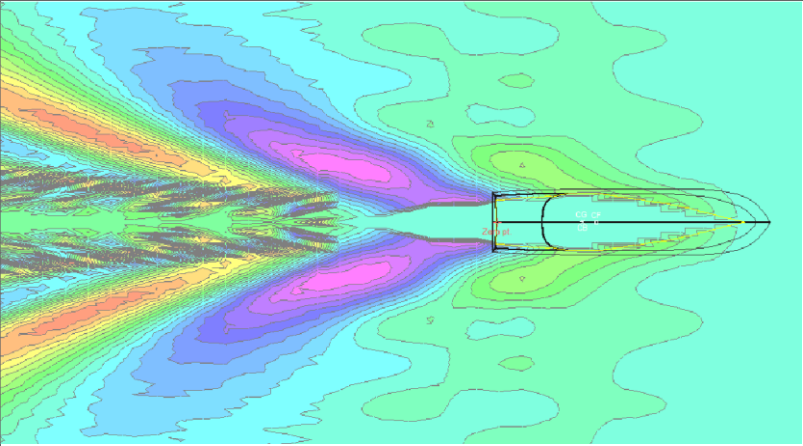
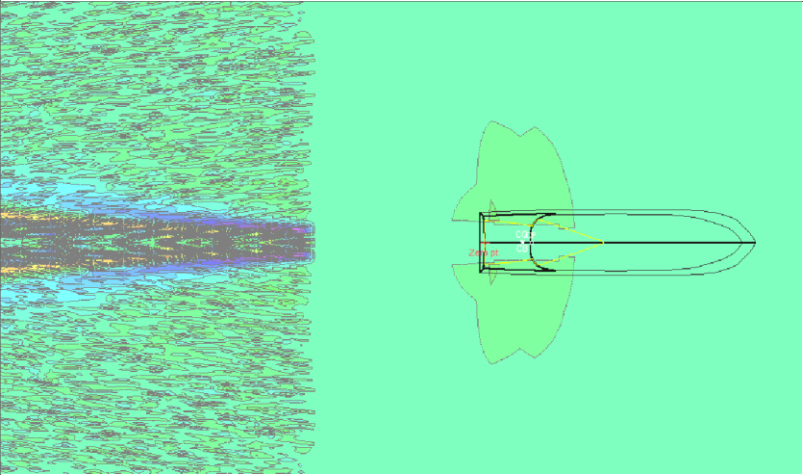


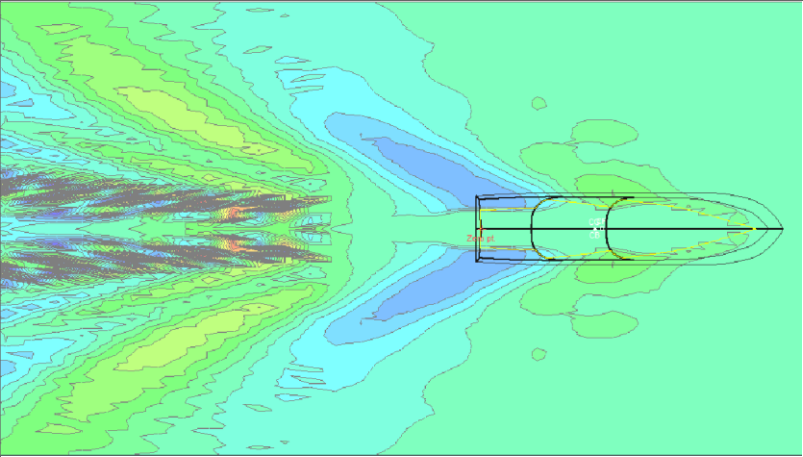
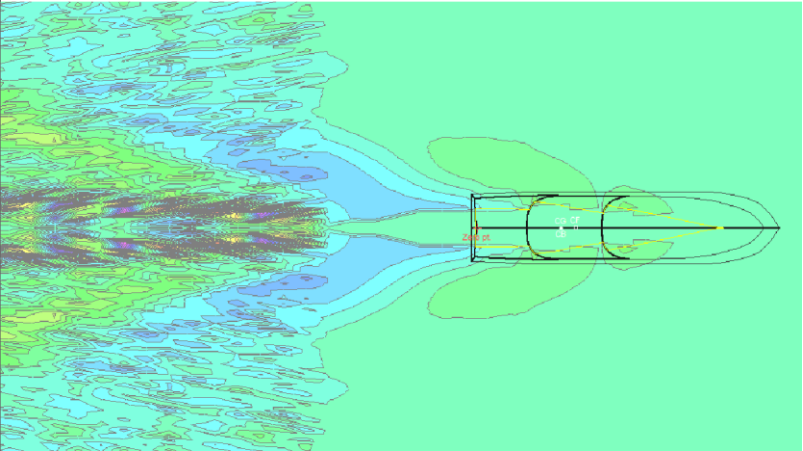
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|--|-------------|-----------|--------|-------|------|--|
| | | | Trim 3 | 5,236 | 2,24 |  |
| | Stepped 2-U | 3 stepped | Trim 1 | 2,494 | 3,39 |  |

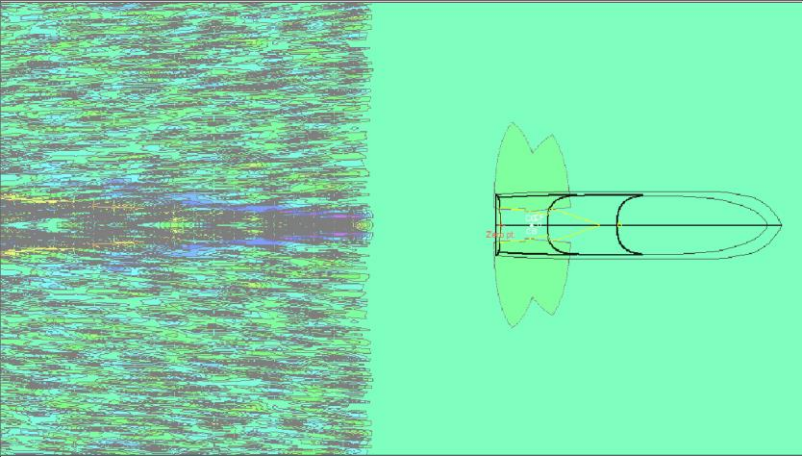
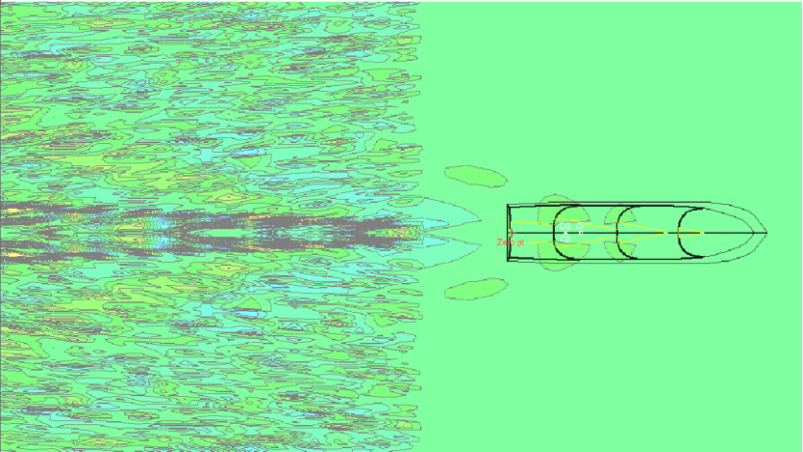
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|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,833 | 2,77 | |
| | | | Trim 3 | 5,236 | 1,92 | |

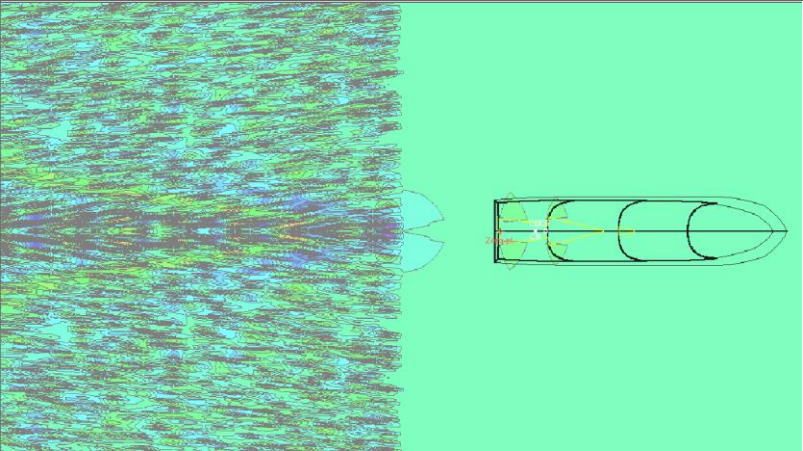
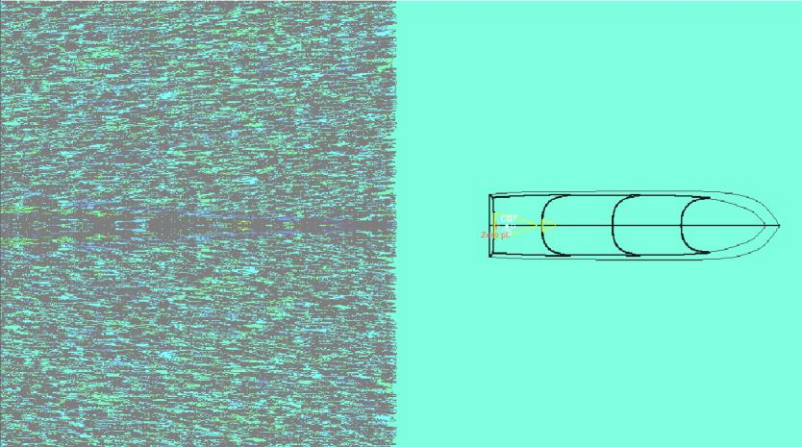
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|--|-------------|-----------|--------|-------|-------|--|
| | Stepped 2-V | 1 stepped | Trim 1 | 2,169 | 21,35 |  |
| | | | Trim 2 | 2,421 | 18,19 |  |

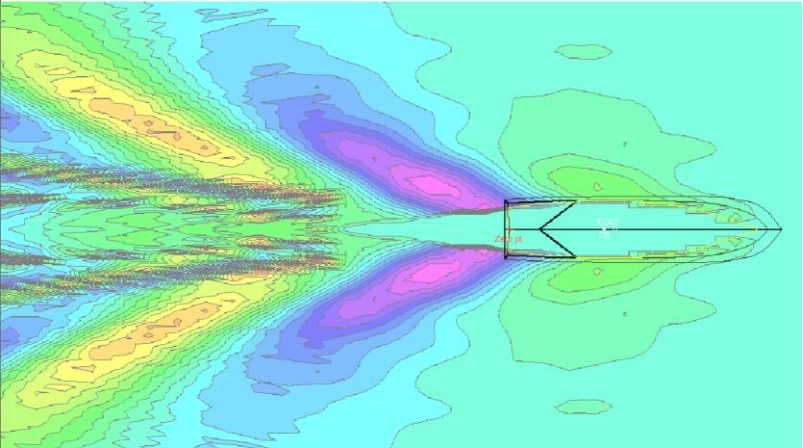
| | | | | | | |
|------------------------|-----------|-----------|--------|-------|-------|--|
| | | | Trim 3 | 4,348 | 11,60 |  |
| Deadrise 10 | Stepped U | 1 stepped | Trim 1 | 2,169 | 14,52 |  |

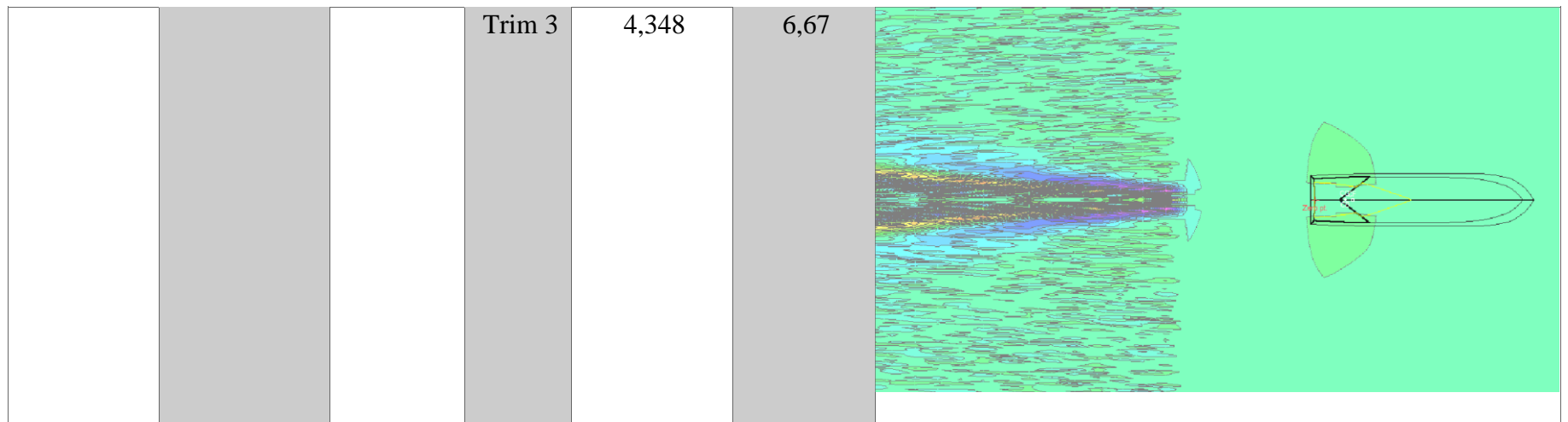
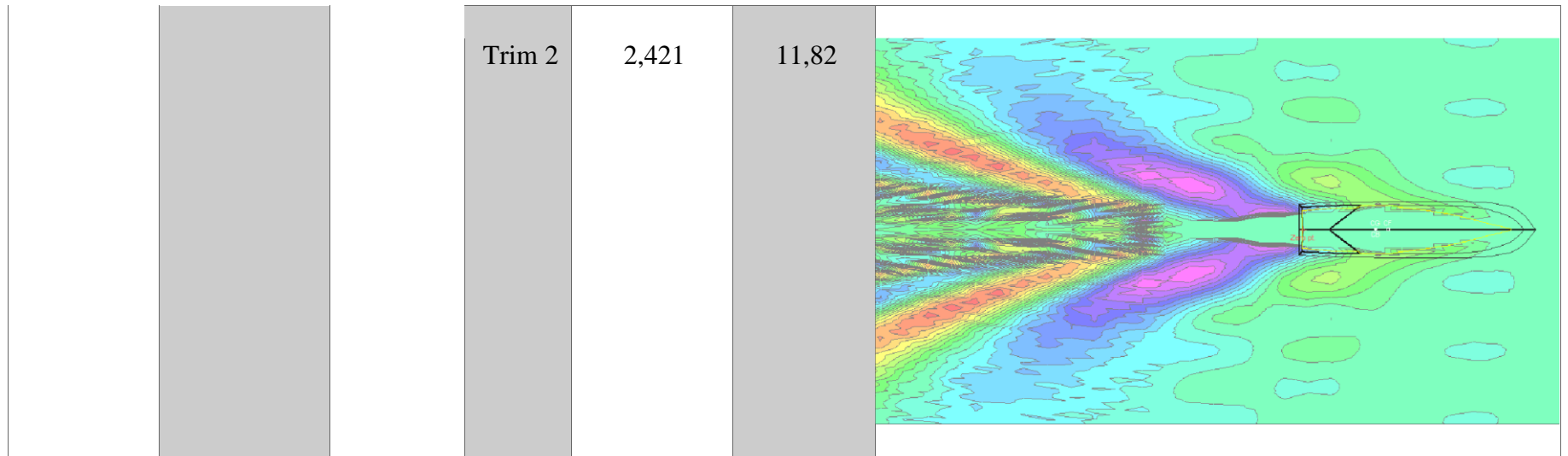
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|--|--|--|--------|-------|-------|--|
| | | | Trim 2 | 2,421 | 11,84 |  |
| | | | Trim 3 | 4,348 | 6,52 |  |

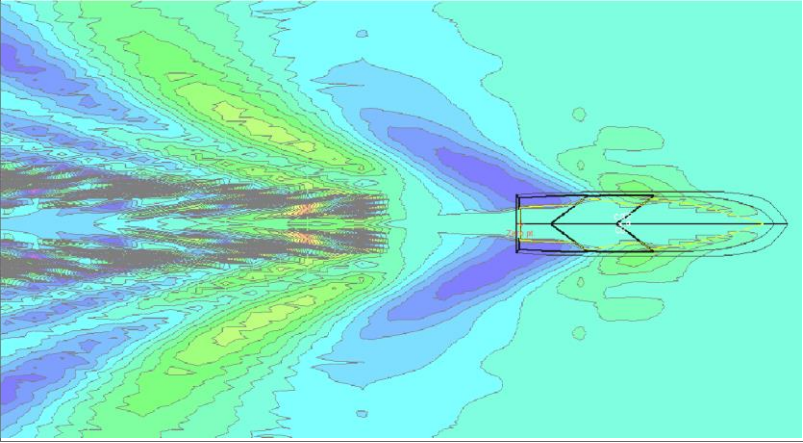
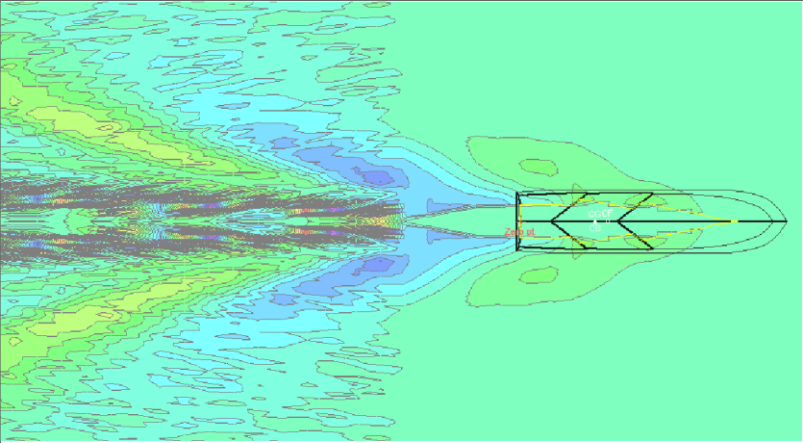
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|--|--|-----------|--------|-------|------|--|
| | | 2 stepped | Trim 1 | 1,919 | 9,17 |  |
| | | | Trim 2 | 2,439 | 5,57 |  |

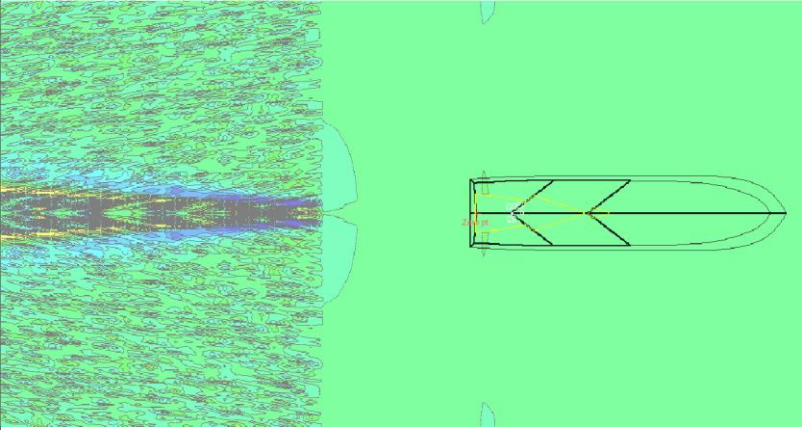
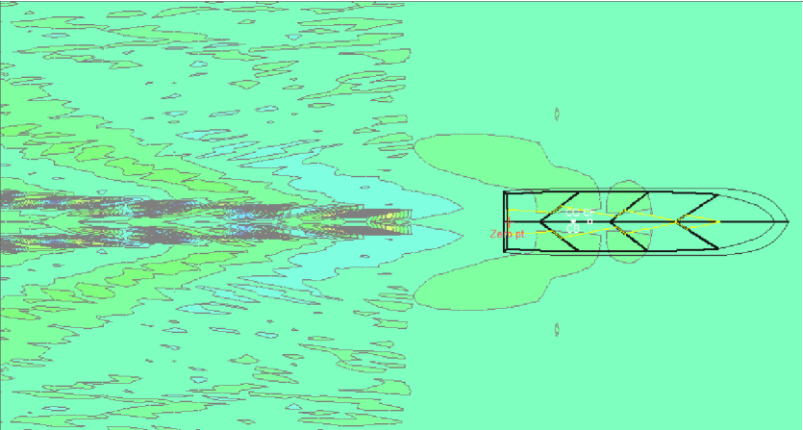
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|--|--|-----------|--------|-------|------|--|
| | | | Trim 3 | 4,272 | 2,77 |  |
| | | 3 stepped | Trim 1 | 2,494 | 1,75 |  |

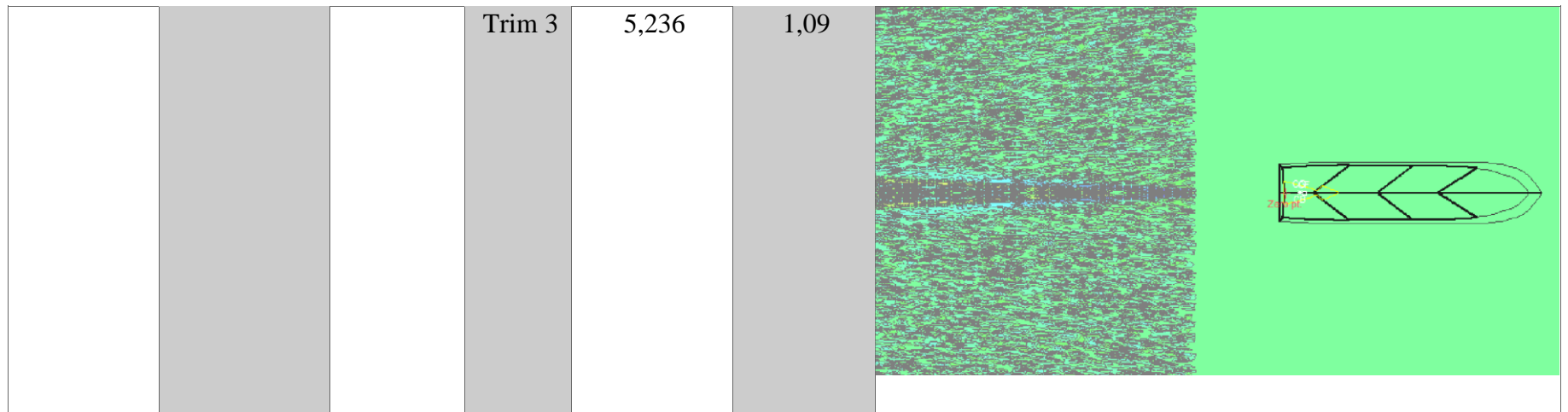
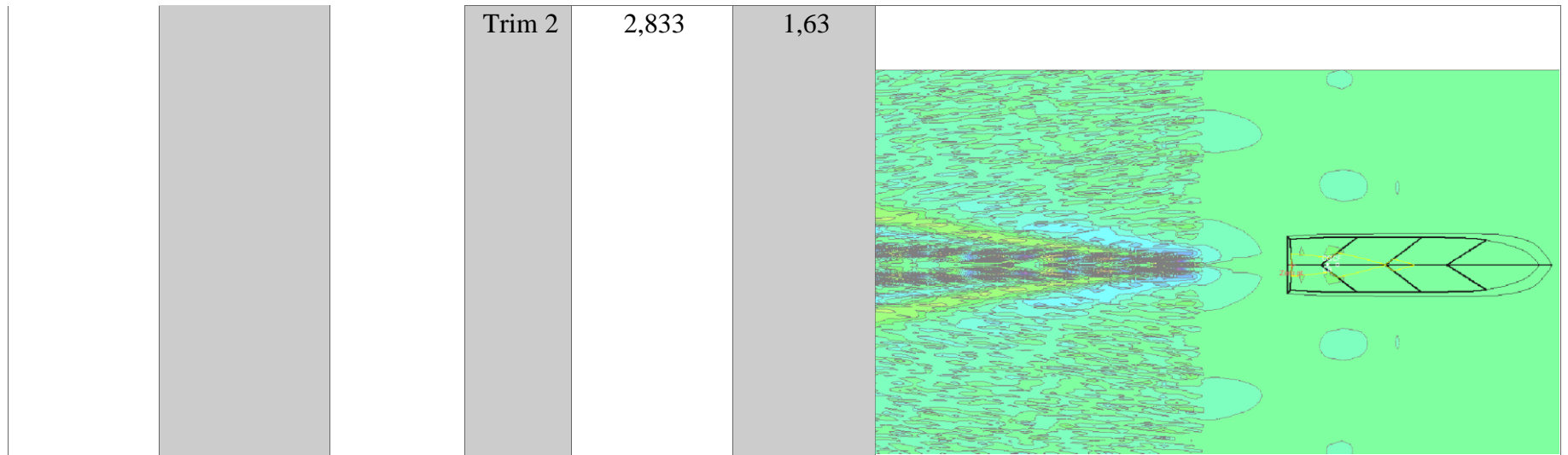
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|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,833 | 1,37 |  |
| | | | Trim 3 | 5,236 | 0,91 |  |

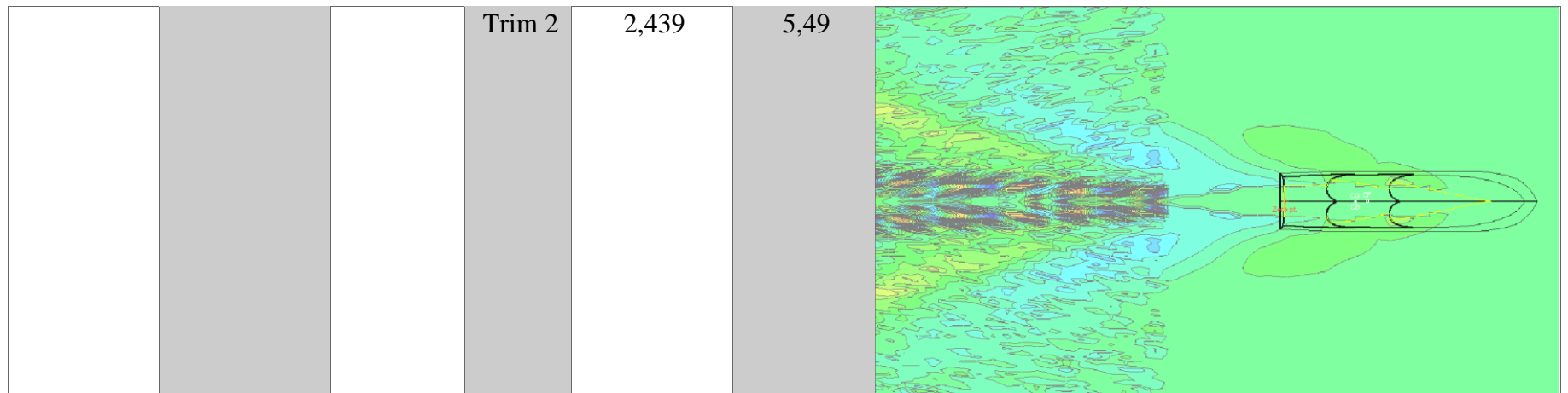
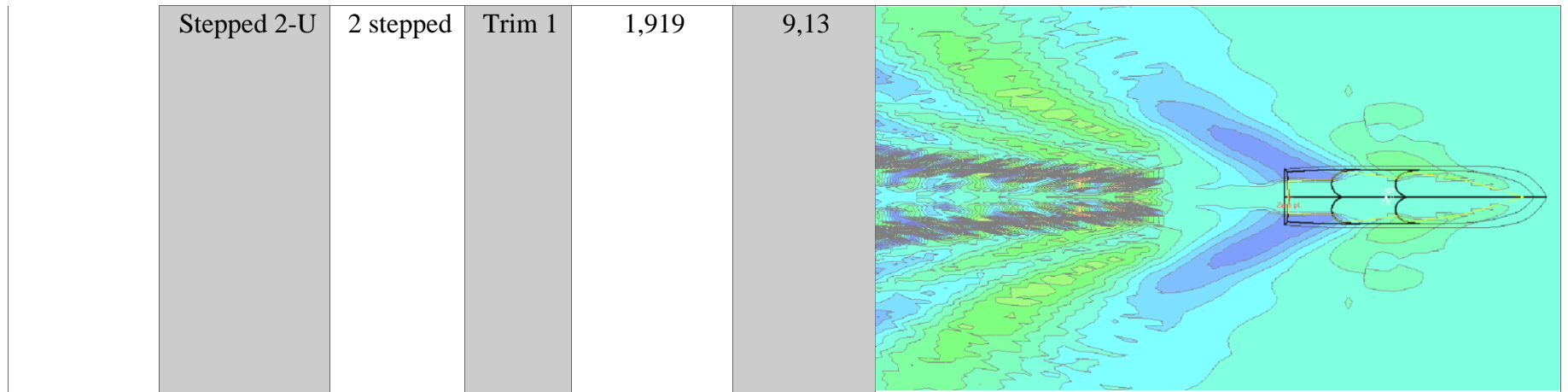
| | | | | | | |
|--|-----------|-----------|--------|-------|-------|---|
| | Stepped V | 1 stepped | Trim 1 | 2,169 | 14,49 |  |
|--|-----------|-----------|--------|-------|-------|---|

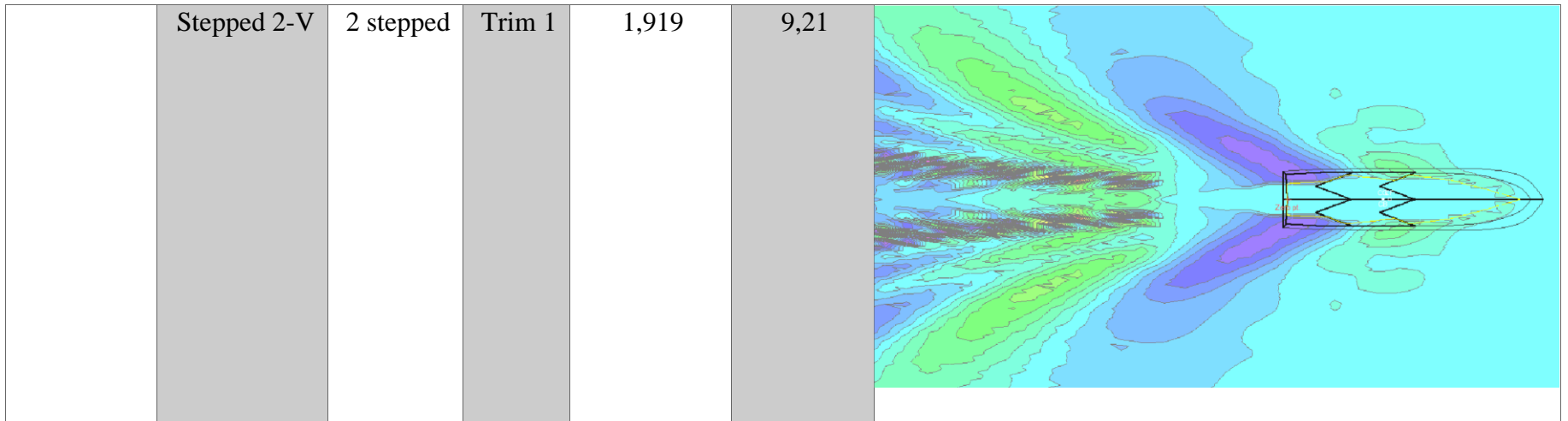
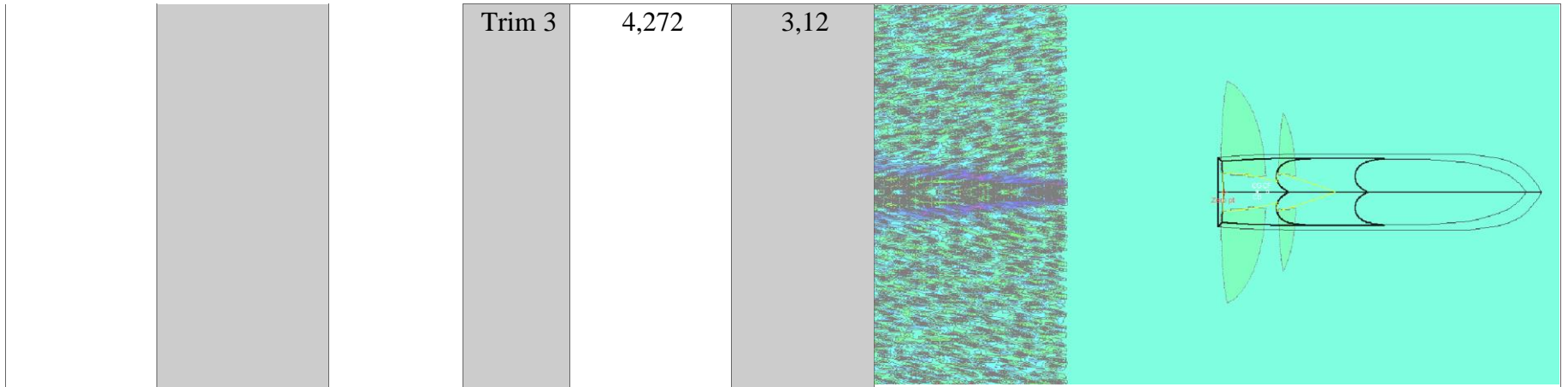


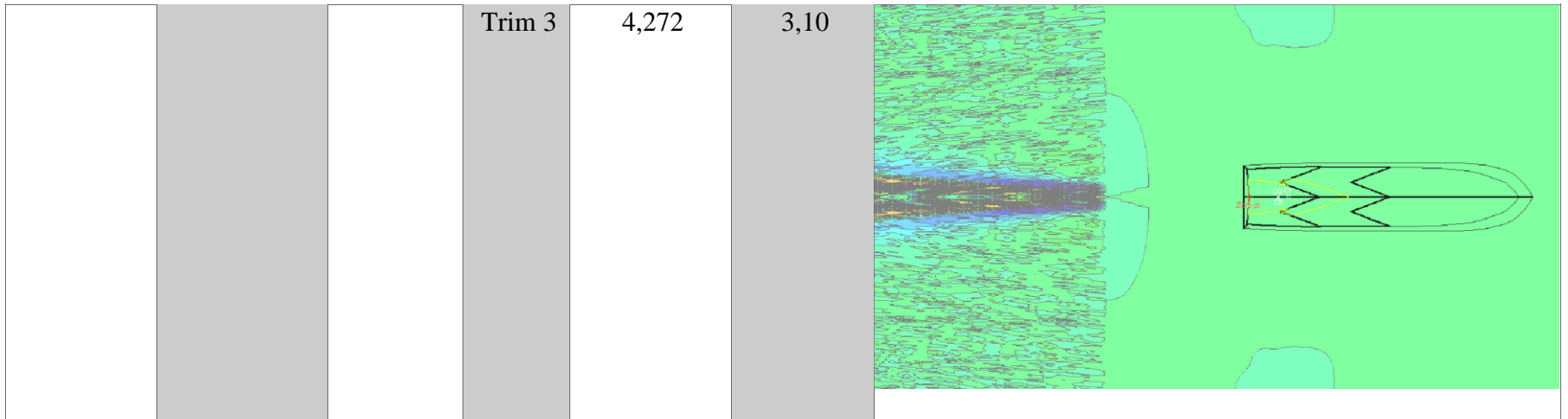
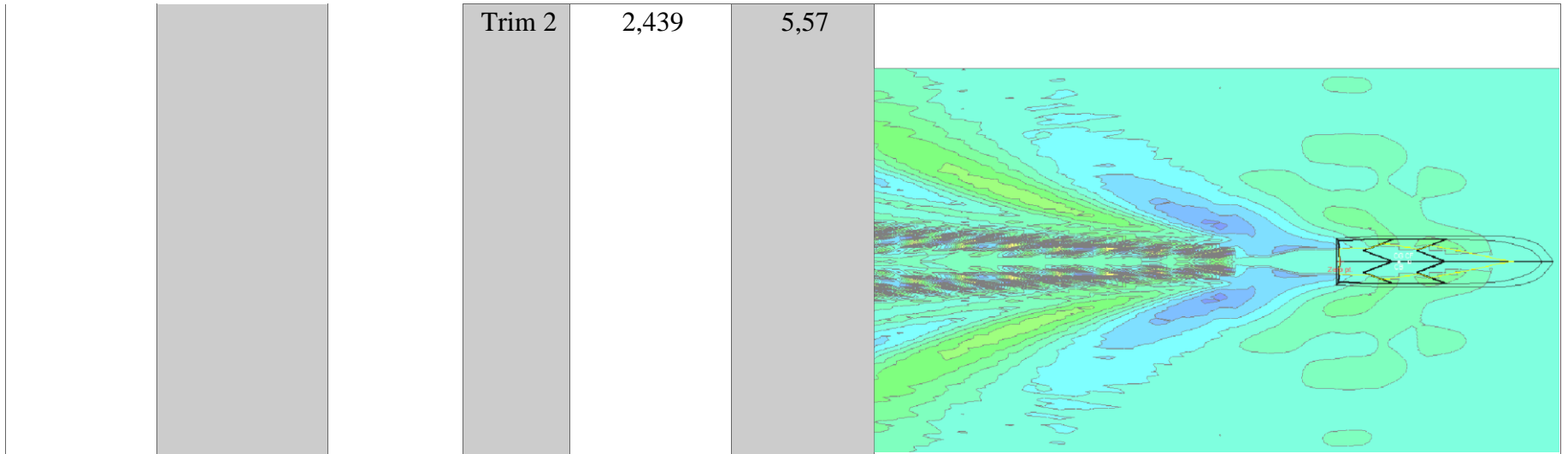
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|--|--|-----------|--------|-------|------|--|
| | | 2 stepped | Trim 1 | 1,919 | 9,28 |  |
| | | | Trim 2 | 2,439 | 9,78 |  |

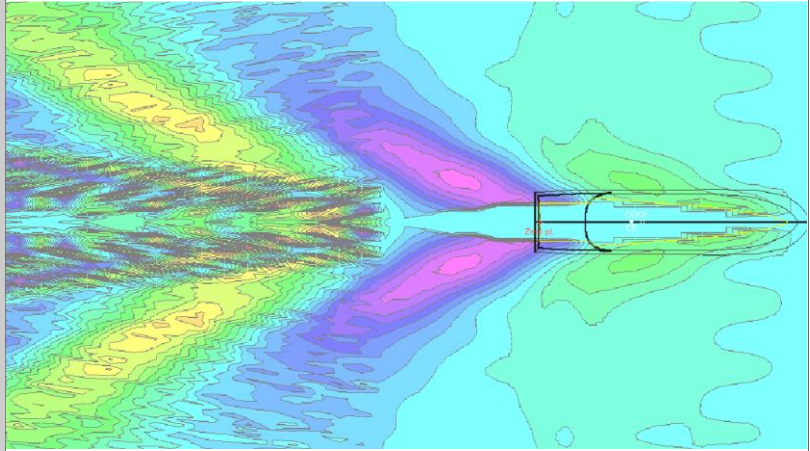
| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | | Trim 3 | 4,272 | 3,03 |  |
| | | 3 stepped | Trim 1 | 2,494 | 2,08 |  |

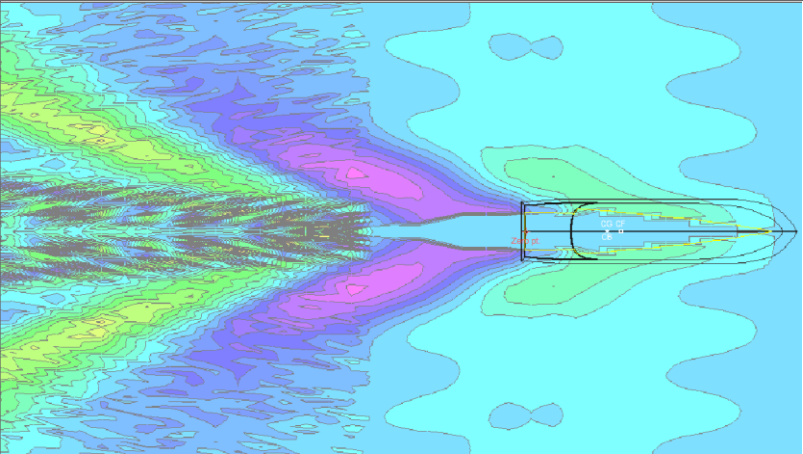
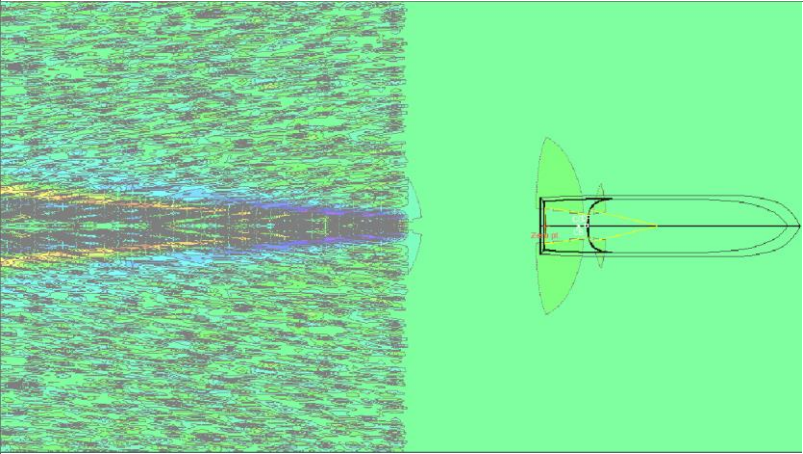


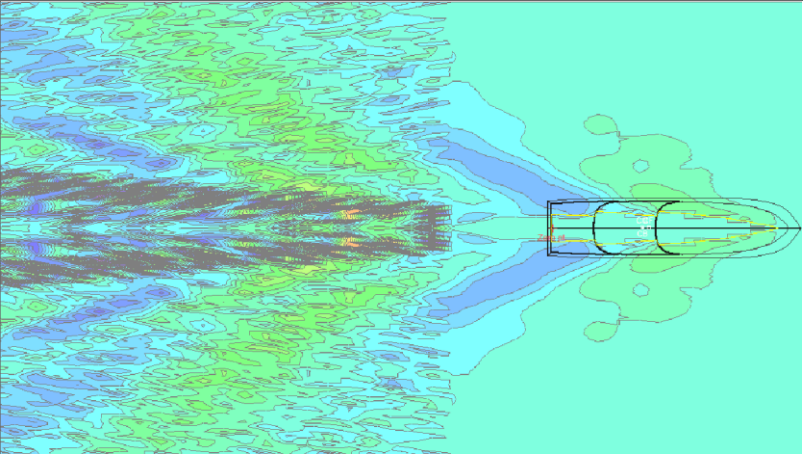
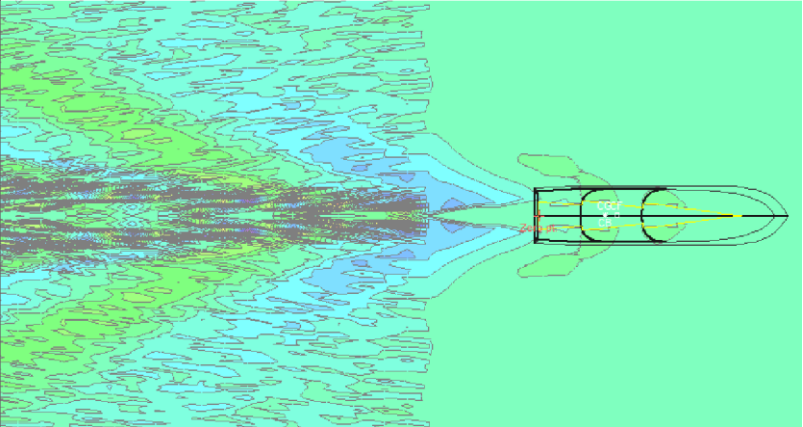


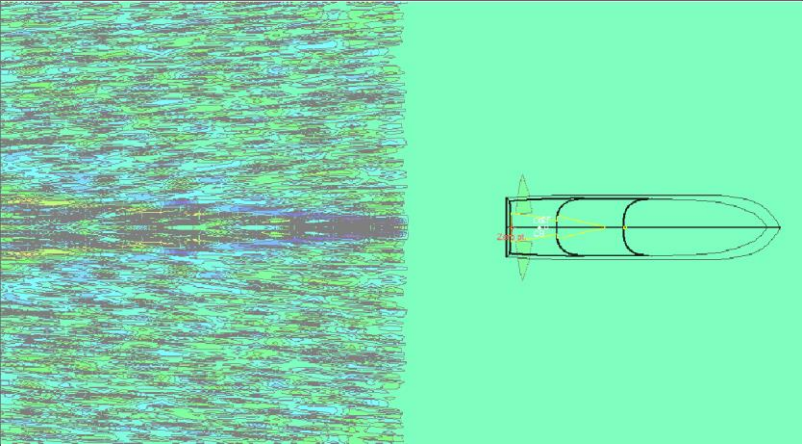
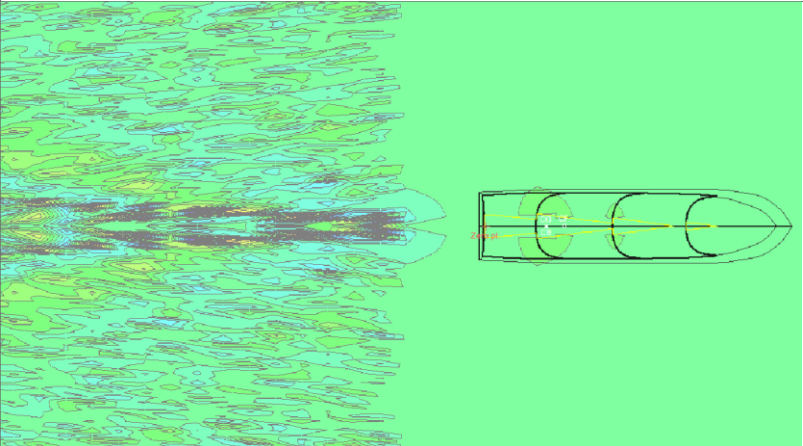


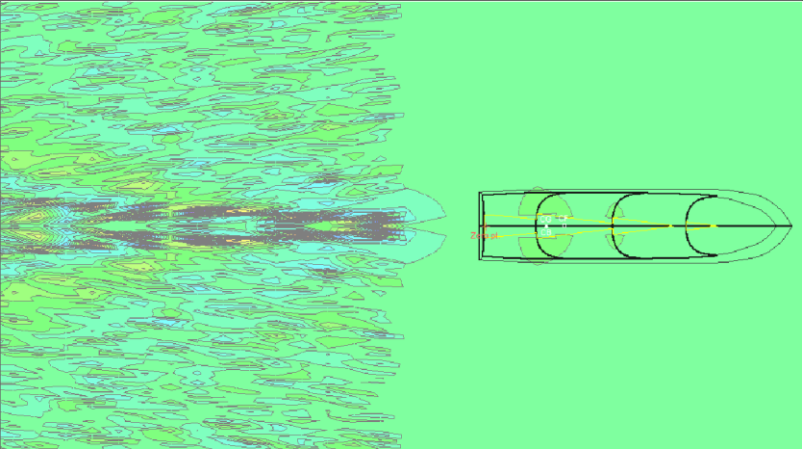
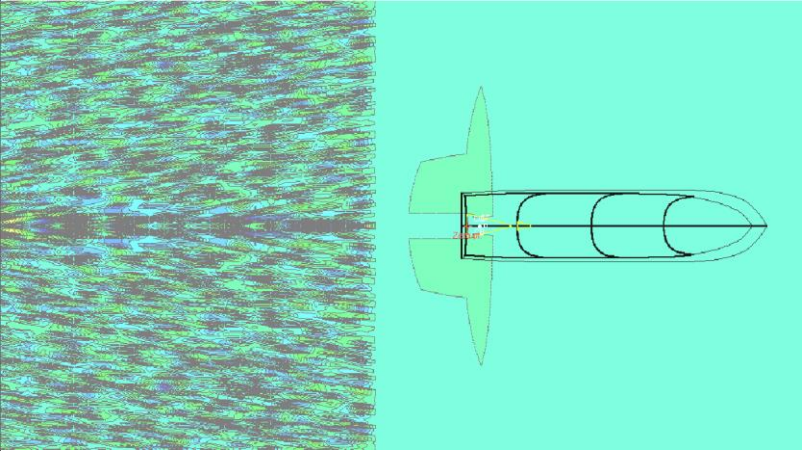


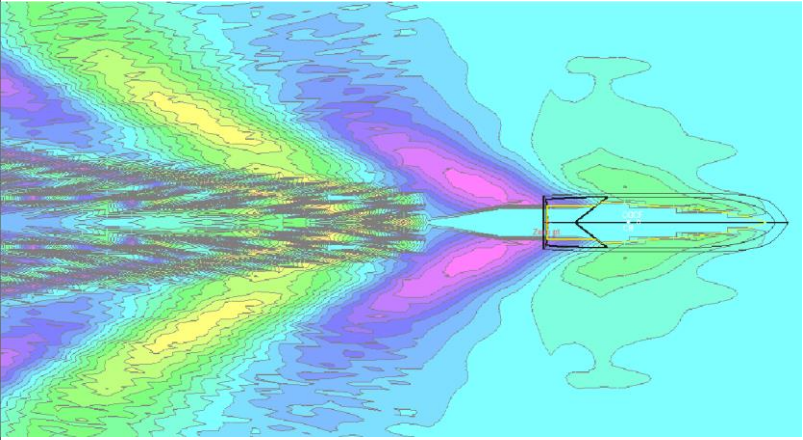
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|--------------------------------------|------------------|------------------|---------------|--------------|--------------|---|
| <p>Deadrise 15</p> | <p>Stepped U</p> | <p>1 stepped</p> | <p>Trim 1</p> | <p>2,169</p> | <p>10,20</p> |  |
|--------------------------------------|------------------|------------------|---------------|--------------|--------------|---|

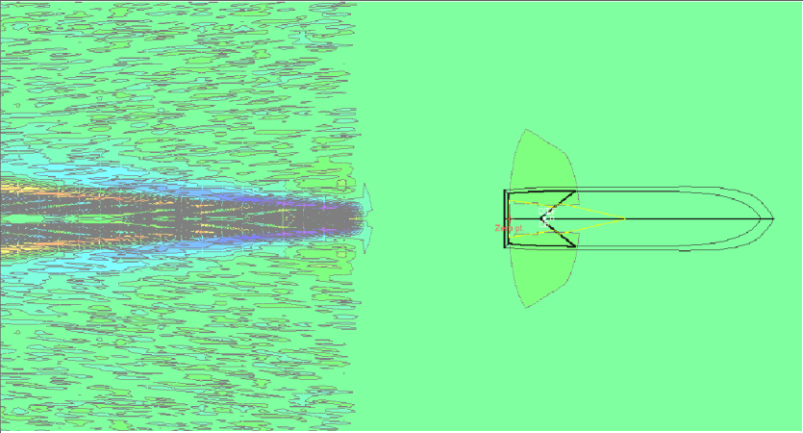
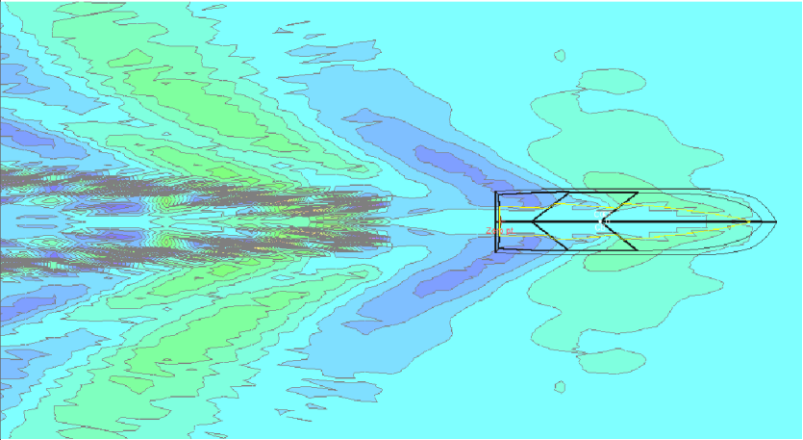
| | | | | | | |
|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,421 | 8,33 |  |
| | | | Trim 3 | 4,348 | 4,88 |  |

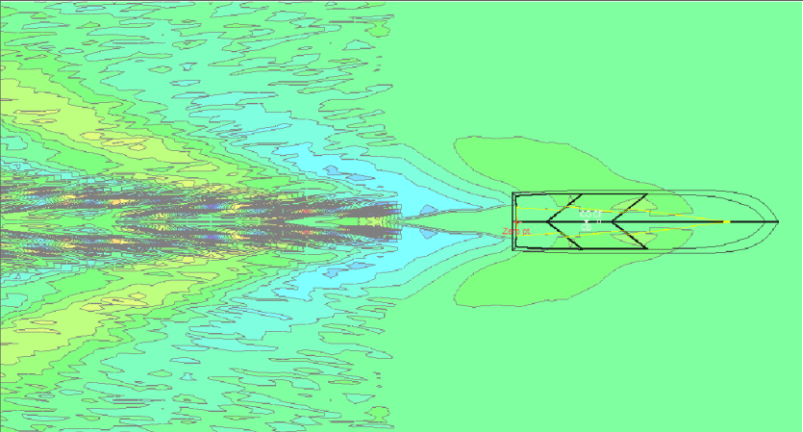
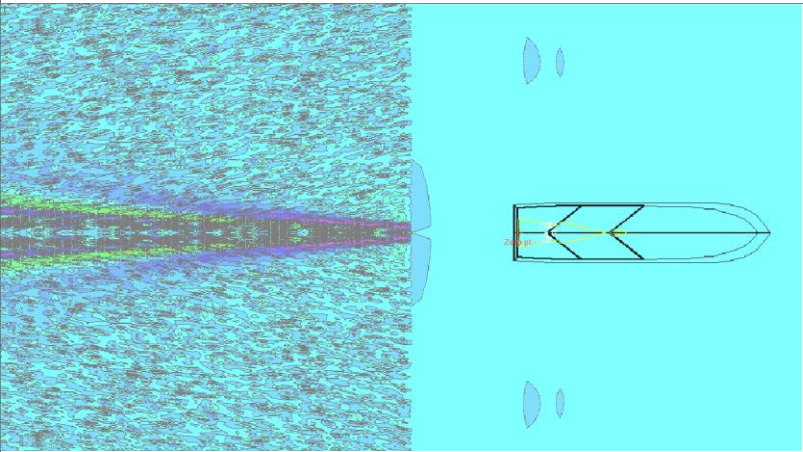
| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | 2 stepped | Trim 1 | 1,919 | 6,35 |  |
| | | | Trim 2 | 2,439 | 3,93 |  |

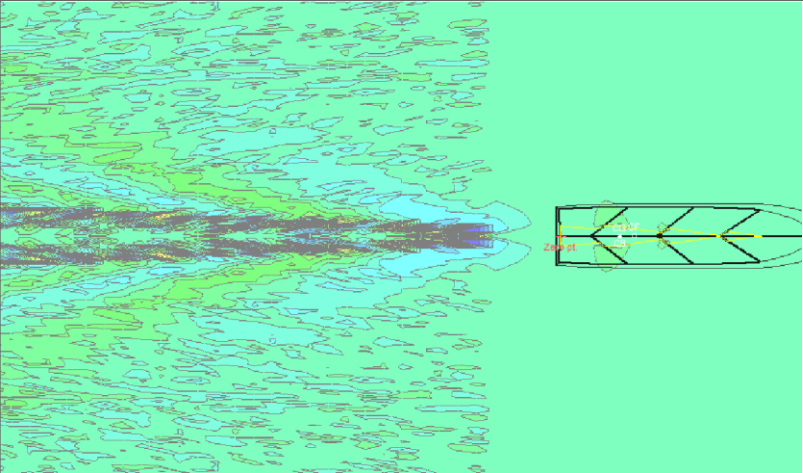
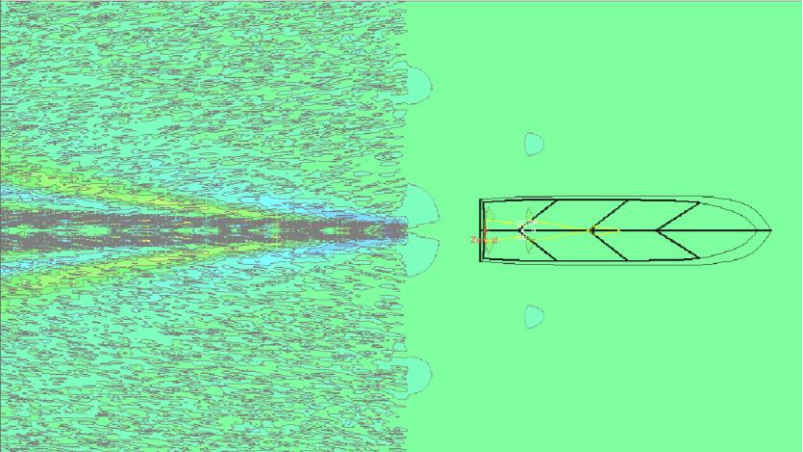
| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | | Trim 3 | 4,272 | 2,13 |  |
| | | 3 stepped | Trim 1 | 2,494 | 1,25 |  |

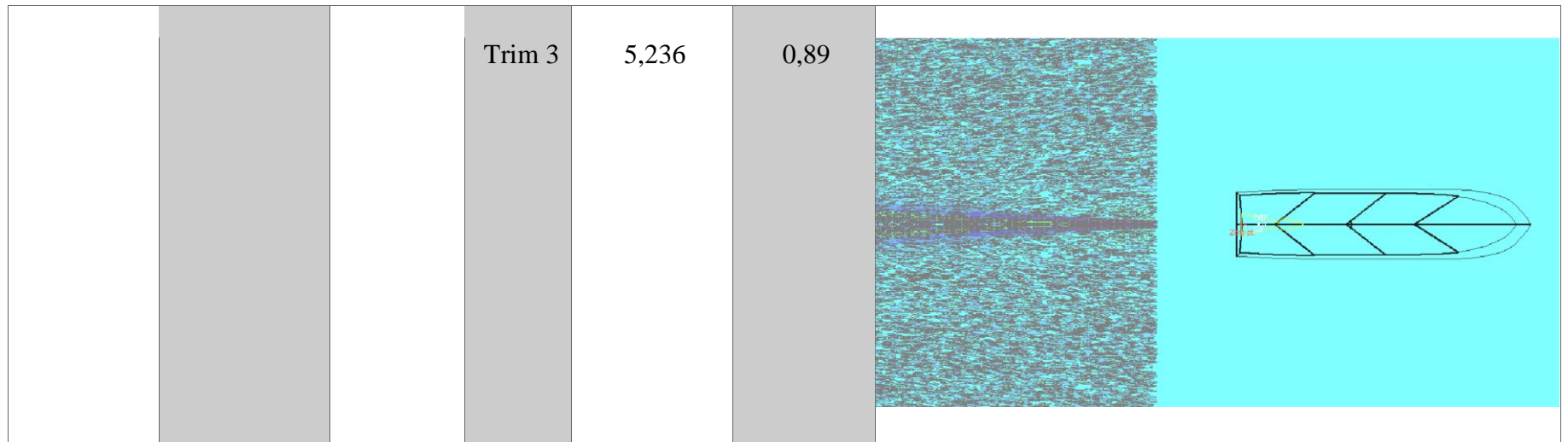
| | | | | | | |
|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,833 | 1,04 |  |
| | | | Trim 3 | 5,236 | 0,75 |  |

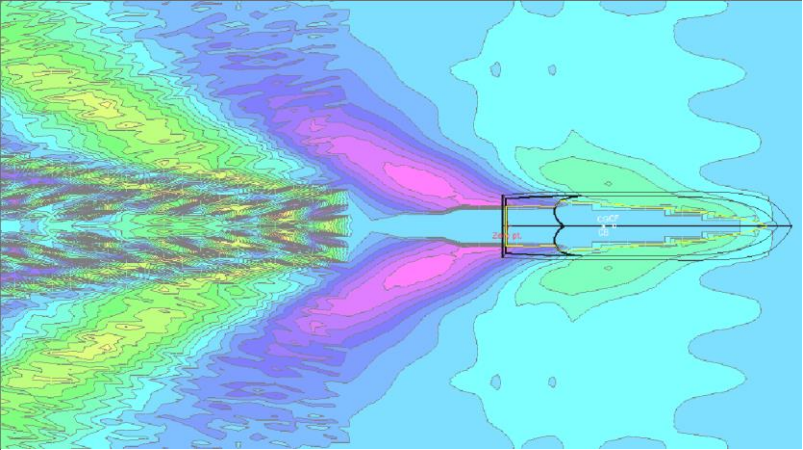
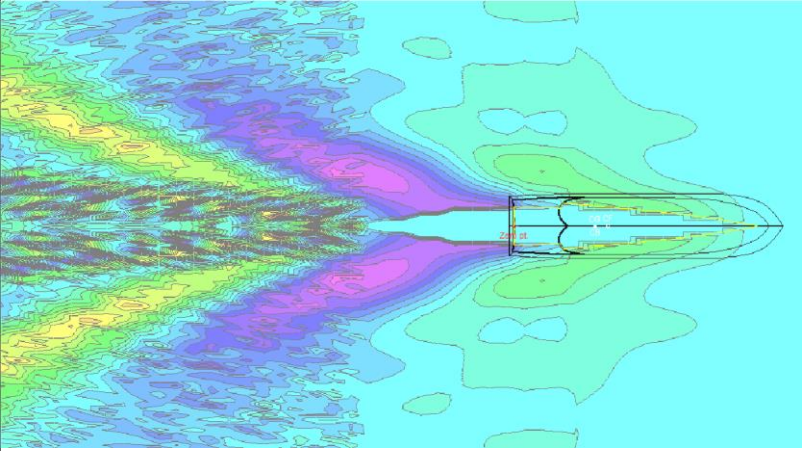
| | | | | | | |
|--|--------------|-----------|--------|-------|-------|---|
| | Stepped V | 1 stepped | Trim 1 | 2,169 | 10,27 |  |
| | | | Trim 2 | 2,421 | | 8,41 |

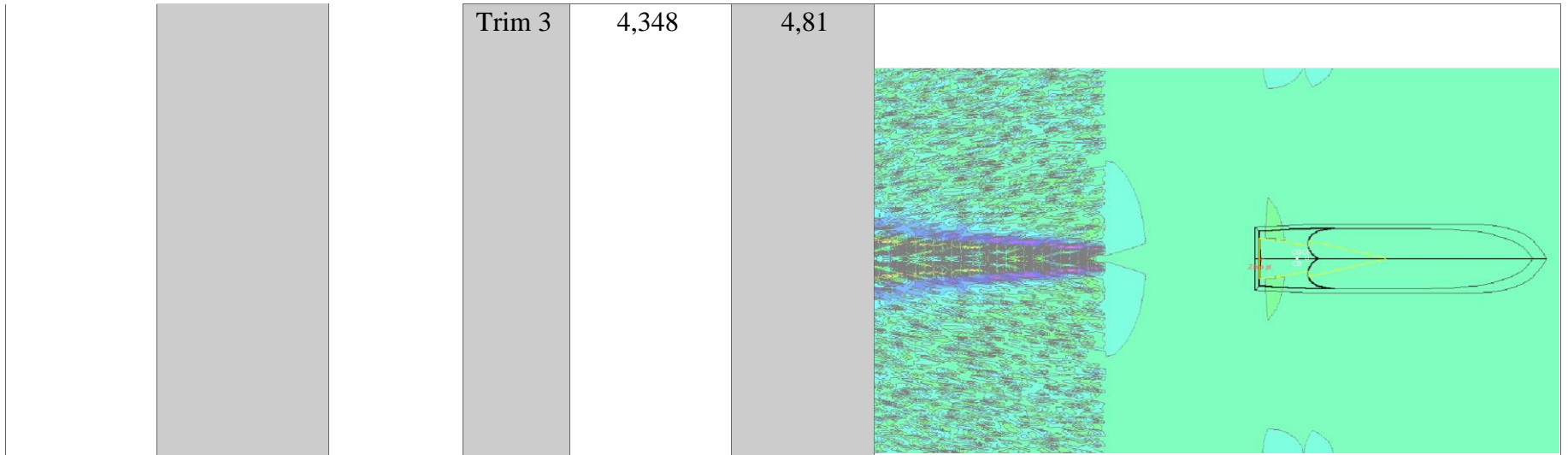
| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | | Trim 3 | 4,348 | 5,11 |  |
| | | 2 stepped | Trim 1 | 1,919 | 6,58 |  |

| | | | | | | |
|--|--|--|--------|-------|------|--|
| | | | Trim 2 | 2,439 | 4,18 |  |
| | | | Trim 3 | 4,272 | 2,36 |  |

| | | | | | | |
|--|--|-----------|--------|-------|------|--|
| | | 3 stepped | Trim 1 | 2,494 | 1,53 |  |
| | | | Trim 2 | 2,833 | 1,26 |  |



| | | | | | | |
|--|-------------|-----------|--------|-------|-------|--|
| | Stepped 2-U | 1 stepped | Trim 1 | 2,169 | 10,18 |  |
| | | | Trim 2 | 2,421 | 8,31 |  |



| | | | | | | |
|--|-------------|-----------|--------|-------|------|--|
| | Stepped 2-V | 3 stepped | Trim 1 | 2,494 | 1,02 | |
| | | | Trim 2 | 2,833 | 1,00 | |

