Velocity Obstacles

enriching ARPA

Marginal CPA
## *a near miss ?*

CPA 295m

Grande Amburgo

Charlemagne
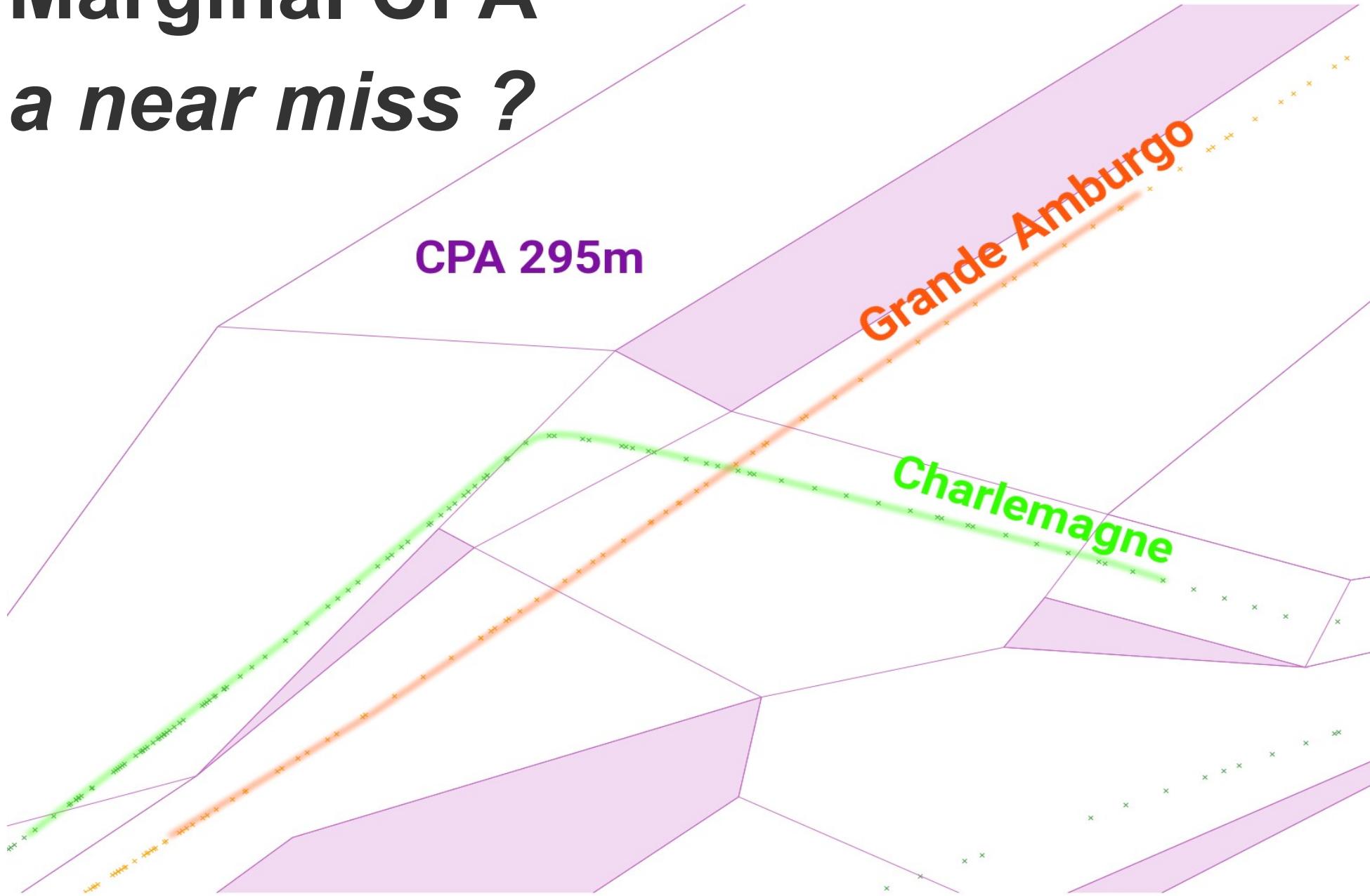
Protected zone
## (similar to aviation)
target has zero speed
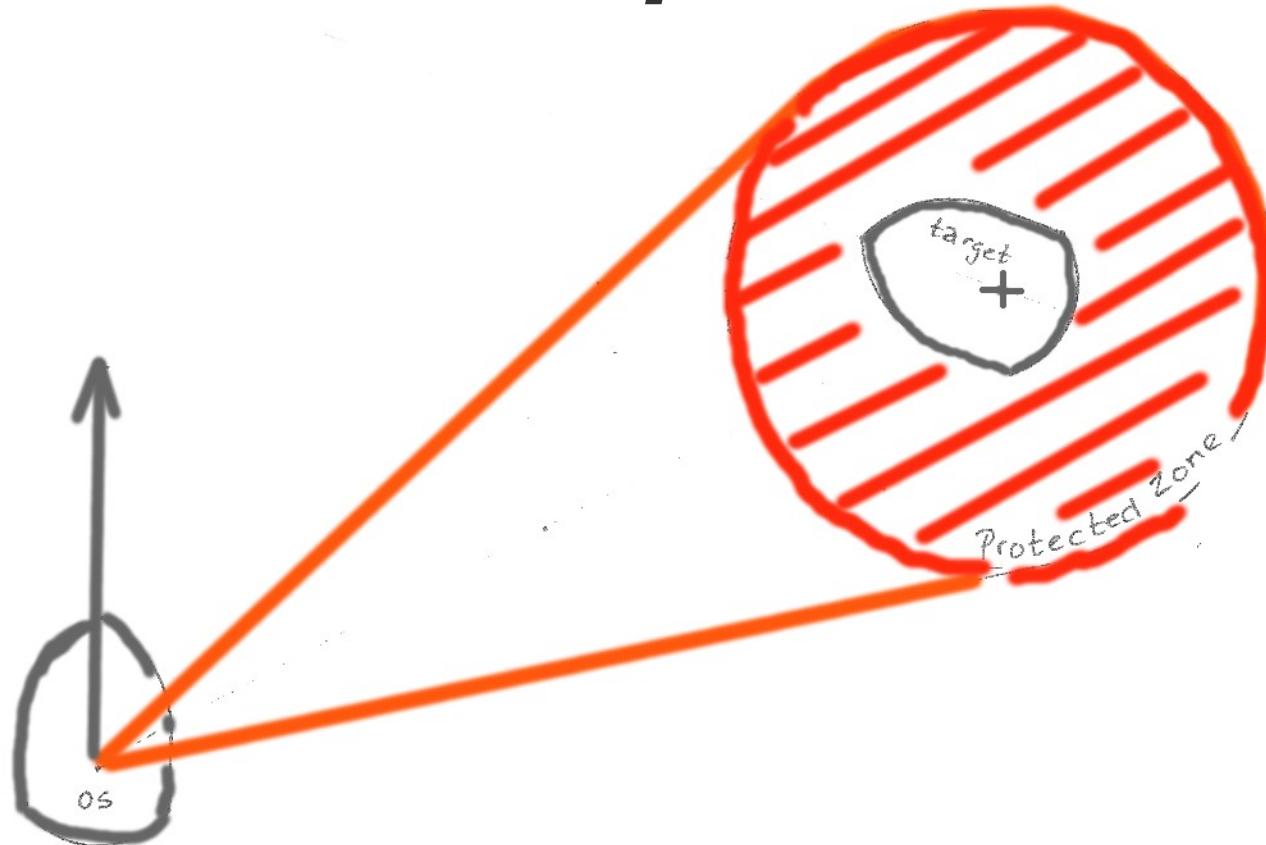
target w. course & speed
## *CPA about nill*
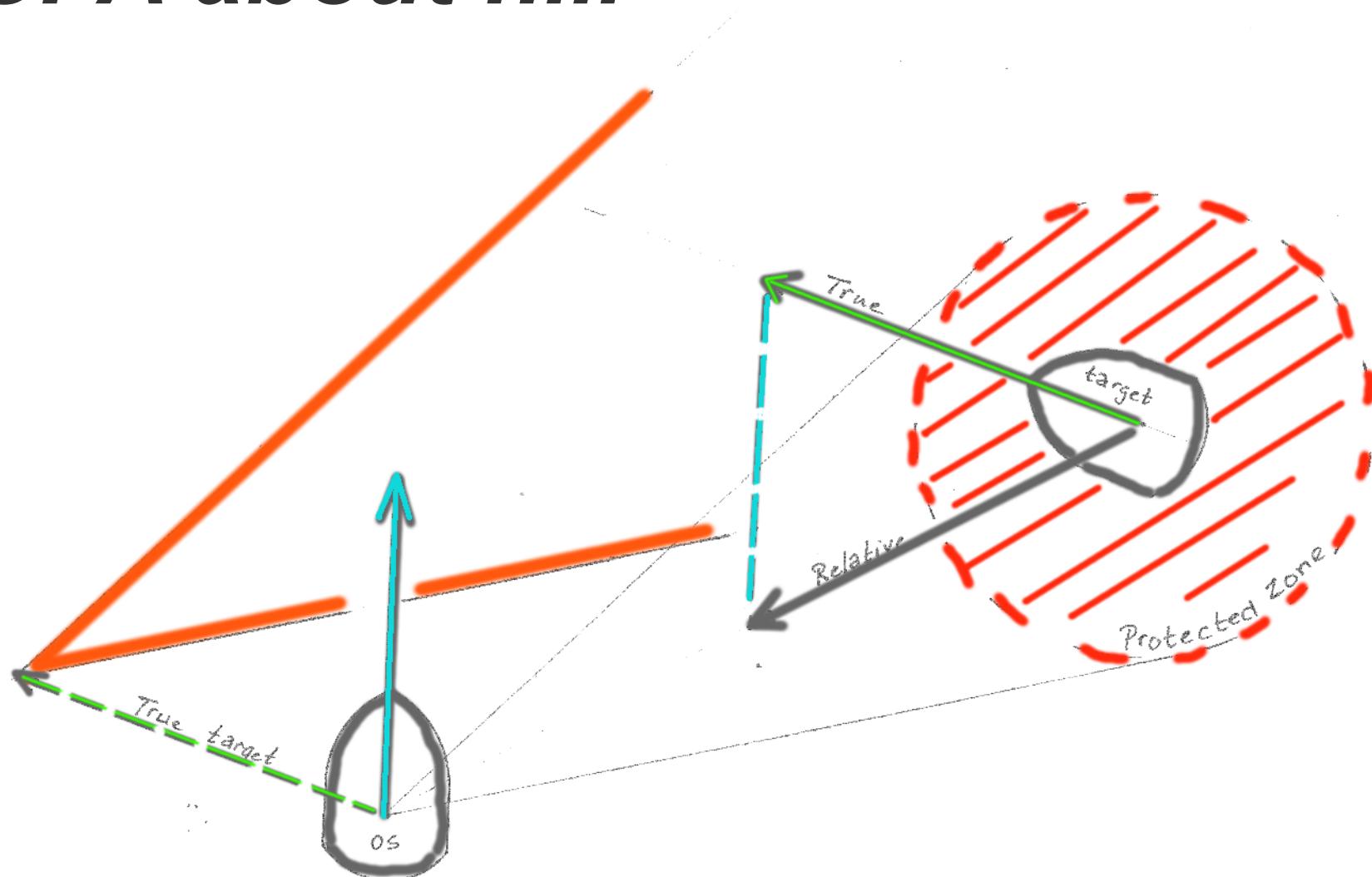
Manoeuvring Envelope
providing solution space
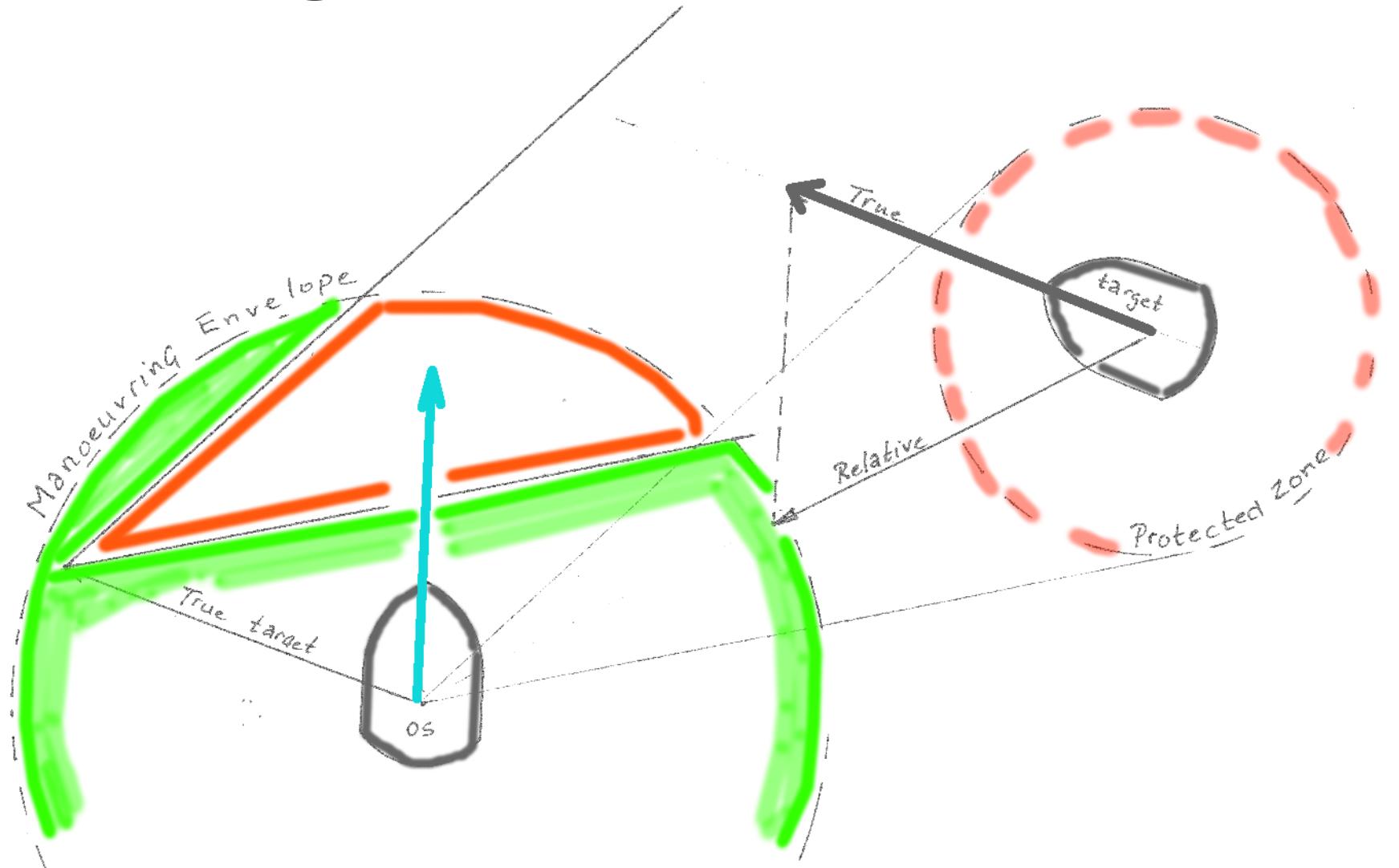
# more complex,
two ships,
no conflict
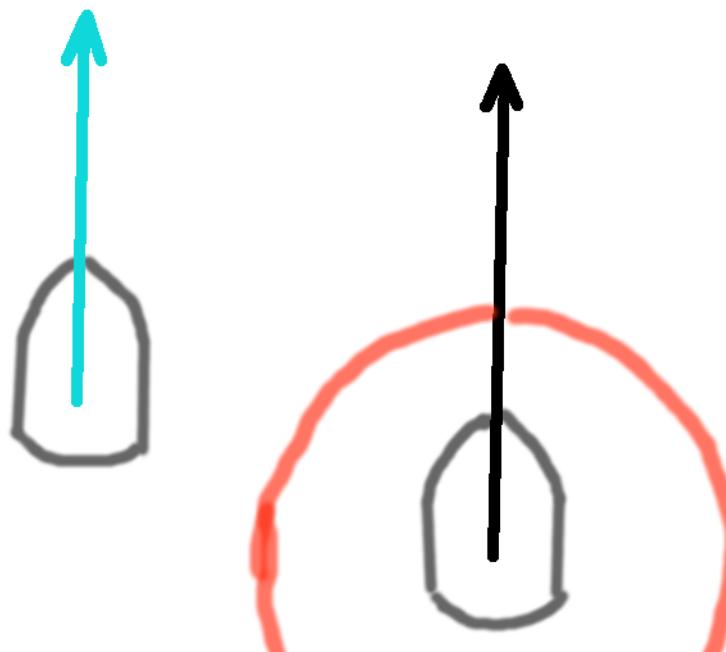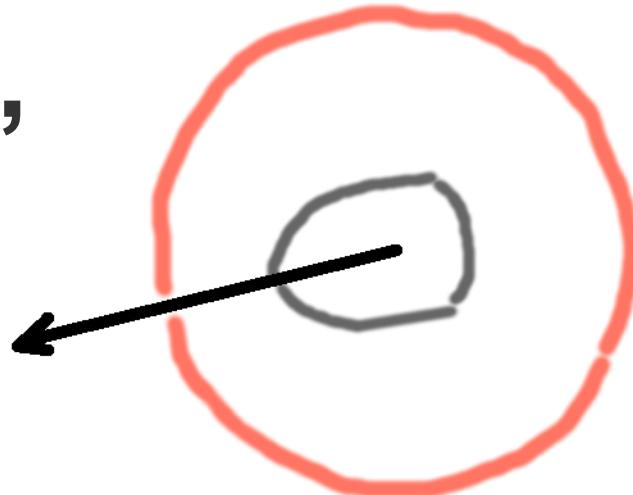
Same situation
## *solution space*
problem space
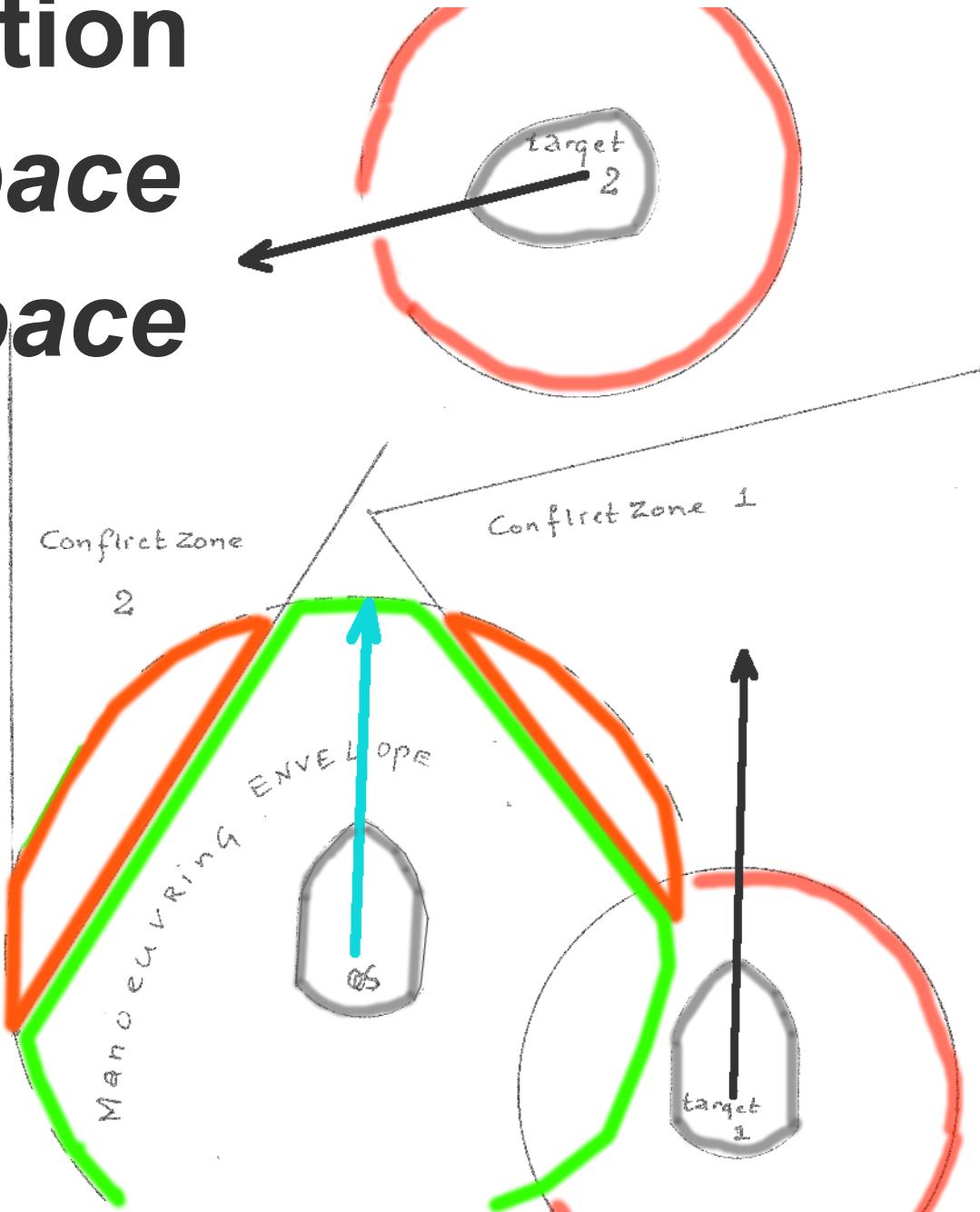
Same situation
rectangular manoeuvring envelope
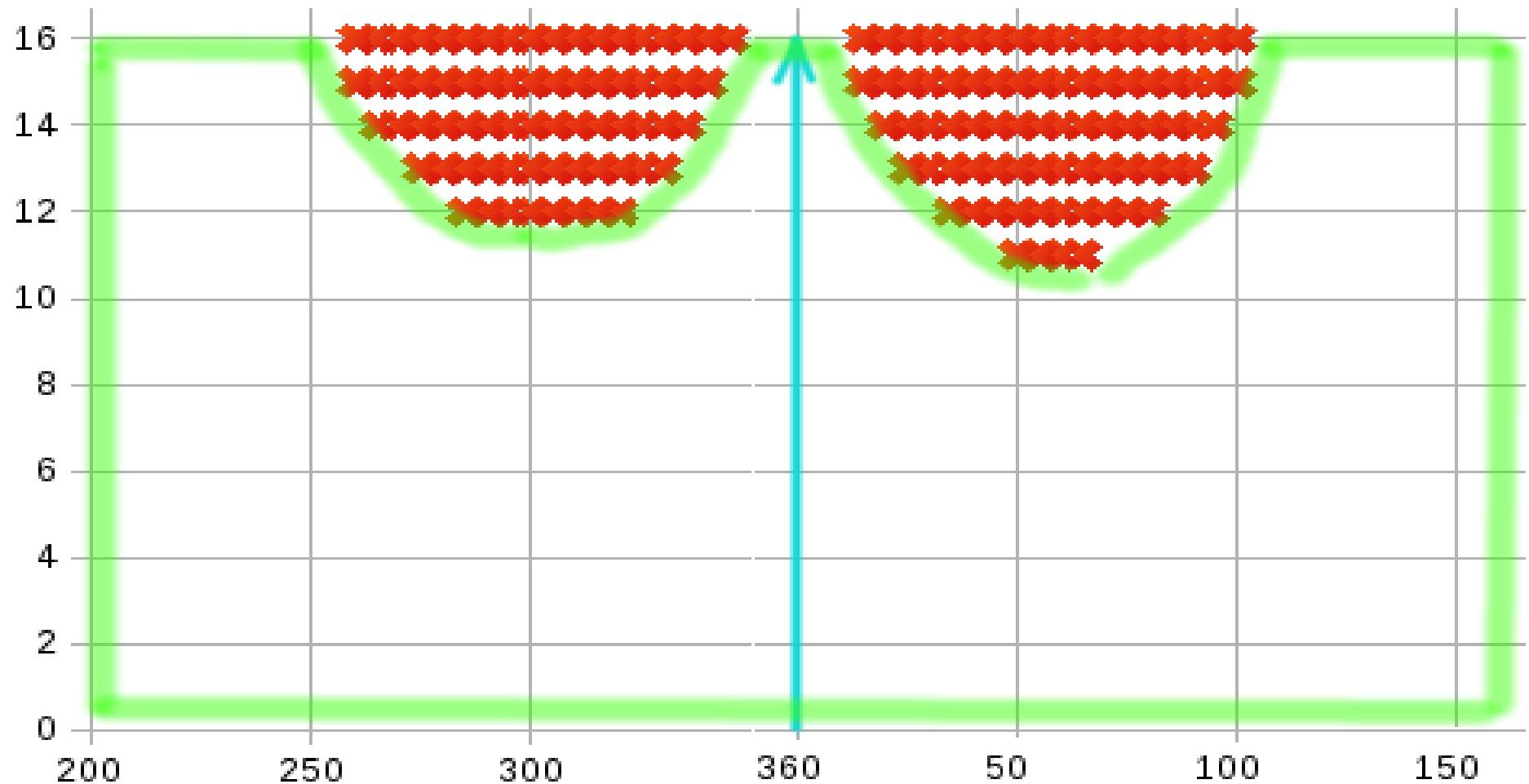
# Dimension protected zone 1 *derived from interviews*
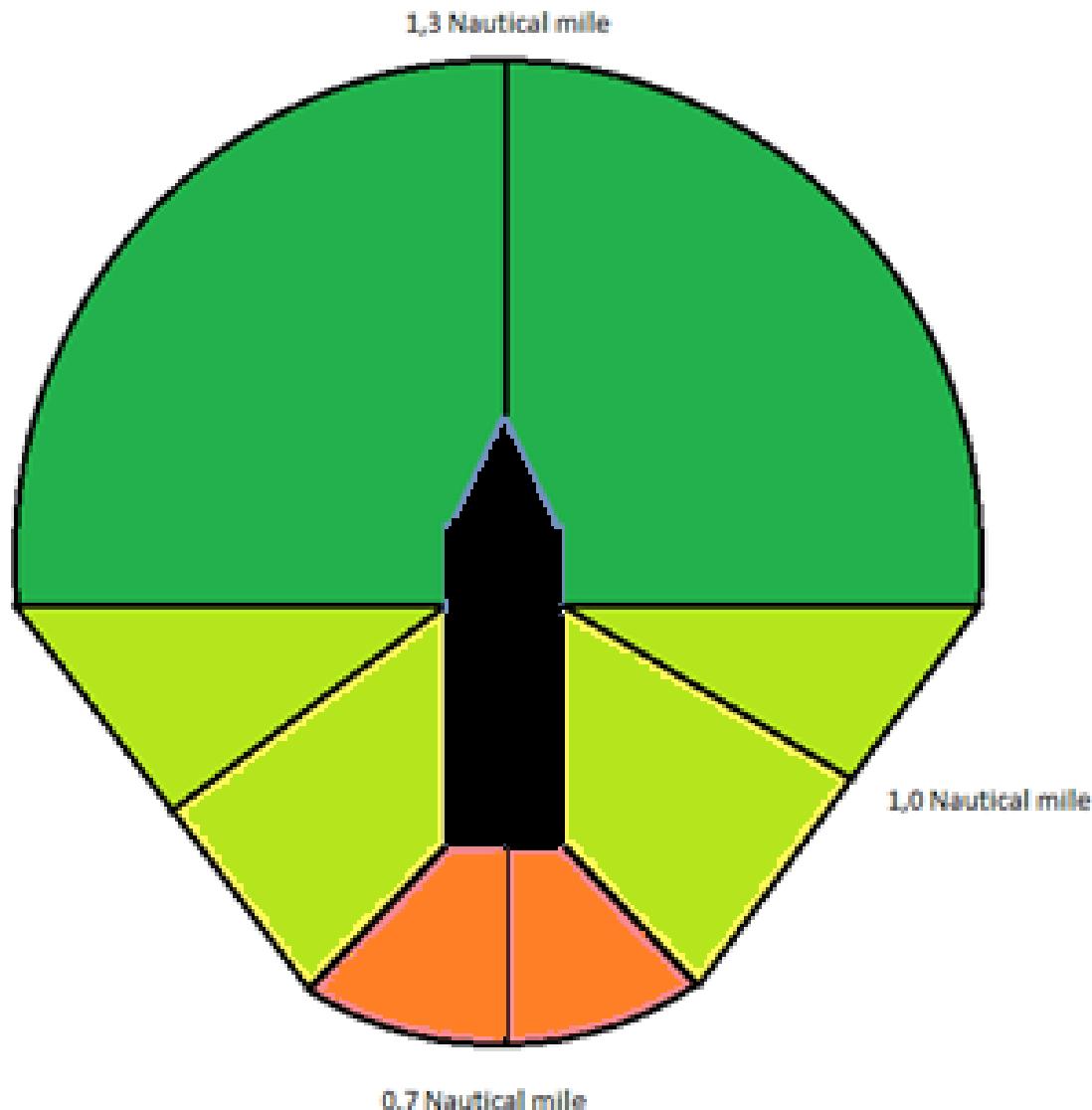
AIS data Vlieland junction
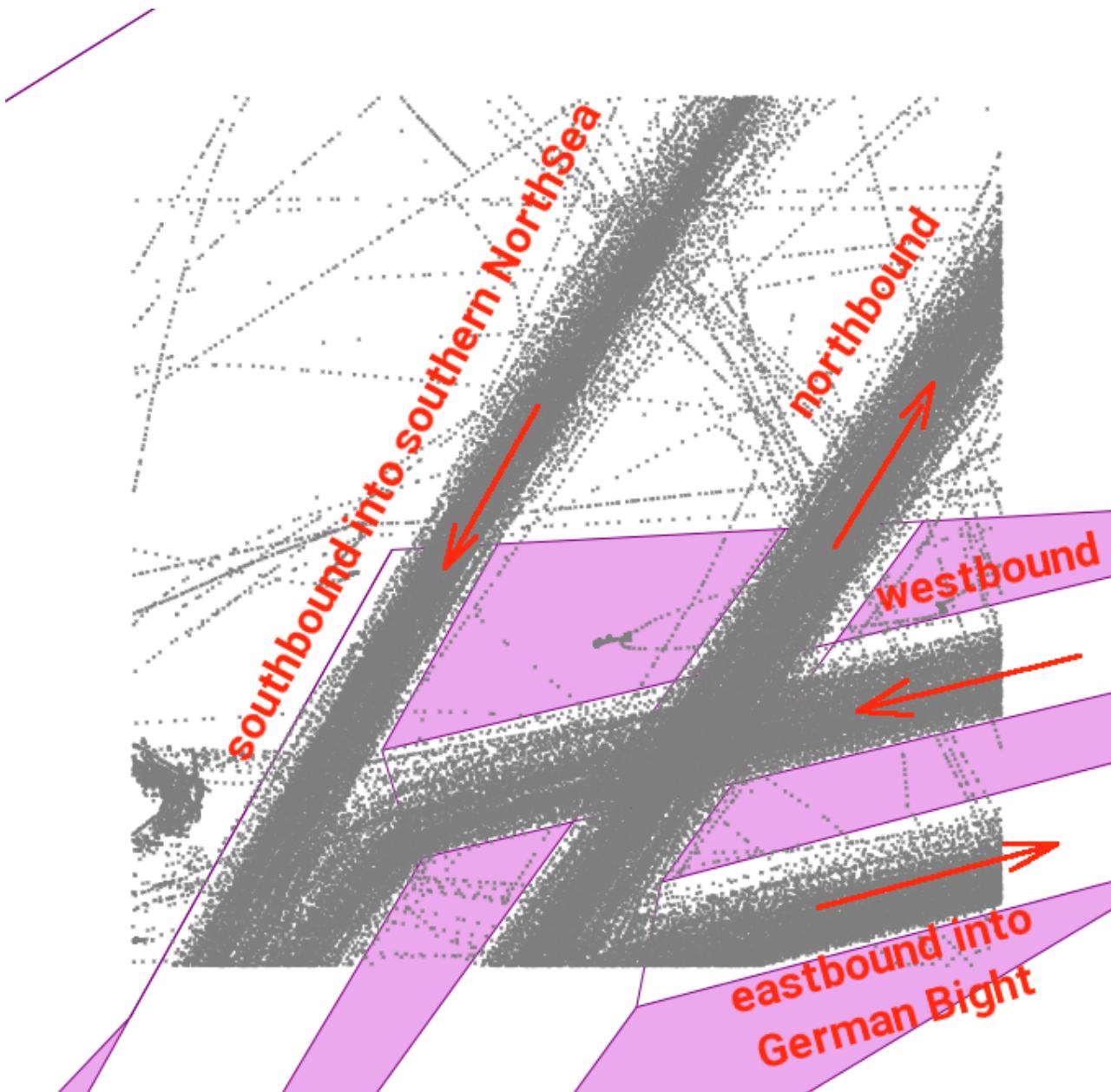
Analysis CPA from AIS footage

805 ships
2-9 sept
2016

"CPAscatter_XYcln.csv" u 18:19
"SD.csv" u 6:7
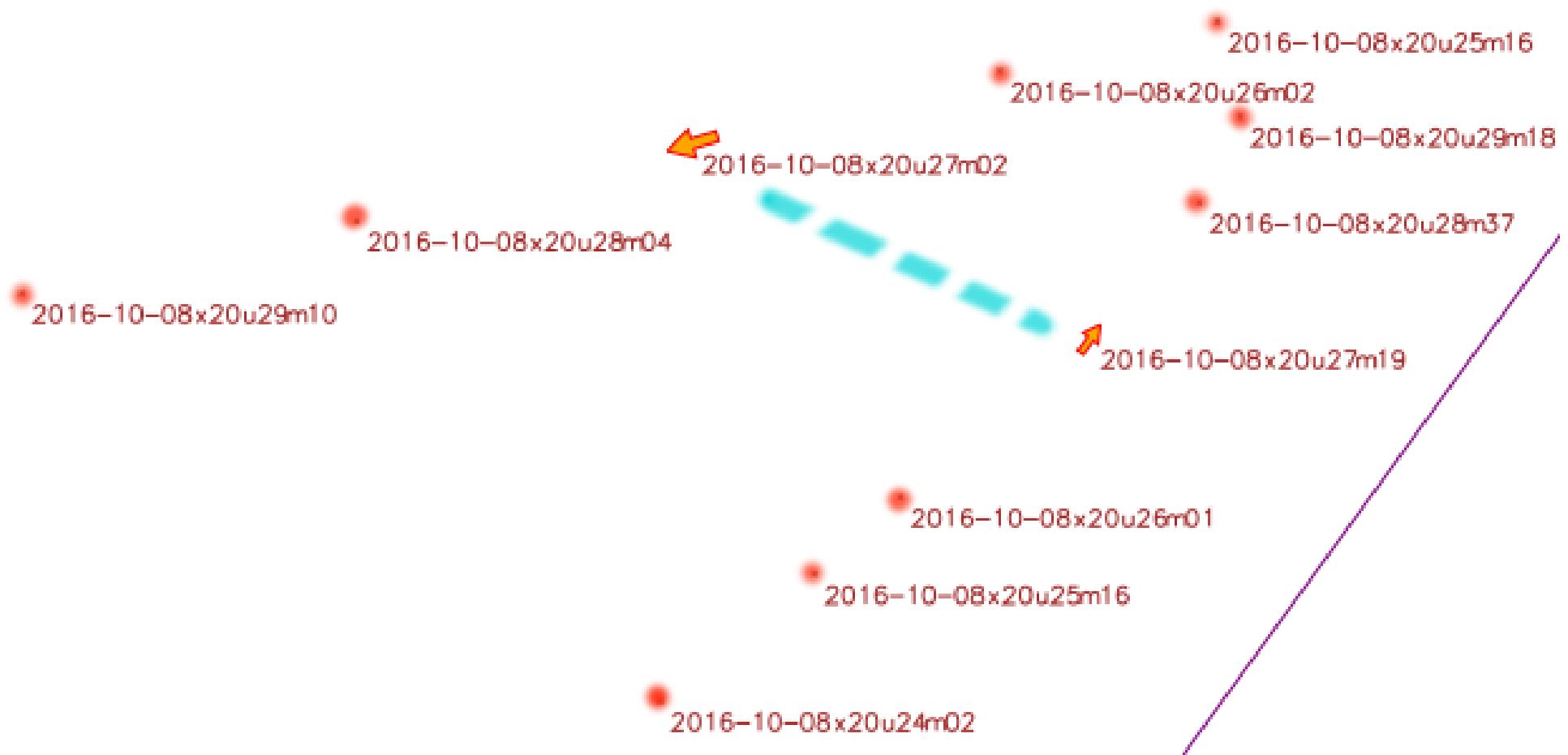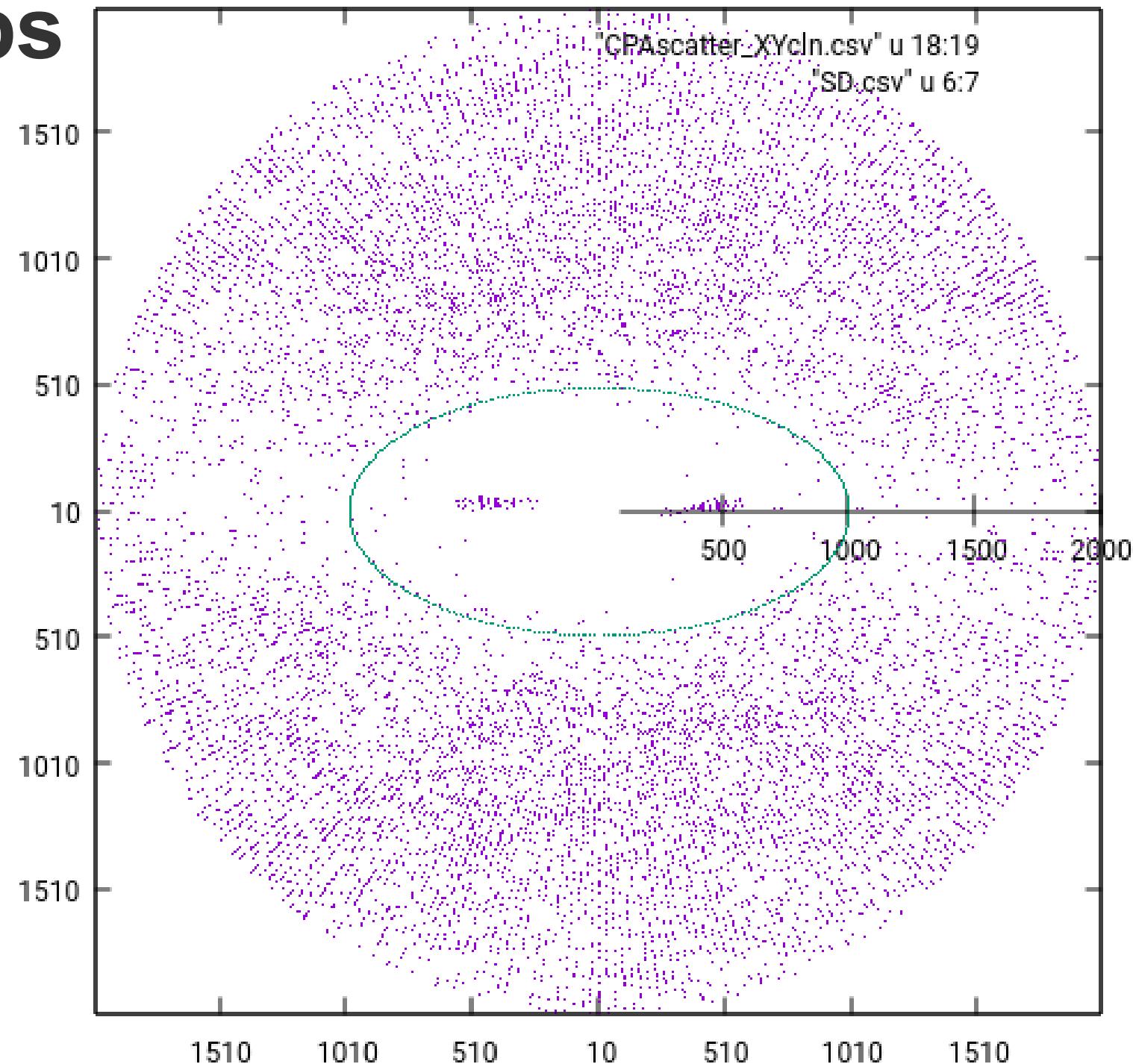
Shape and dimension of own ship's protected zone

- Needs to be **flexible**, depending on several factors, a.o.

  - Type of ship

  - Sailing Area

  - Captains orders

- Ideally, you want to communicate this with the other ships around (**Maritime Cloud** preferably)

Anti-stress factor

- Stay out of your neighbour's protected zone

    - because COLREG's seem not always adequately applied

    - because a complex close quarter situation leads easily to an accident

Research going on
e.g. How does this effect Situation Awareness?

- RAAK project in maritime safety (16 months left)

  - Partners are welcome

- Ba and MSc students doing research projects

  - a.o. Maritime Safety, Augmented Reality and Ecological Interface Design

  - Partners are welcome

Augmented Reality pre-view 1

Augmented Reality pre-view 2
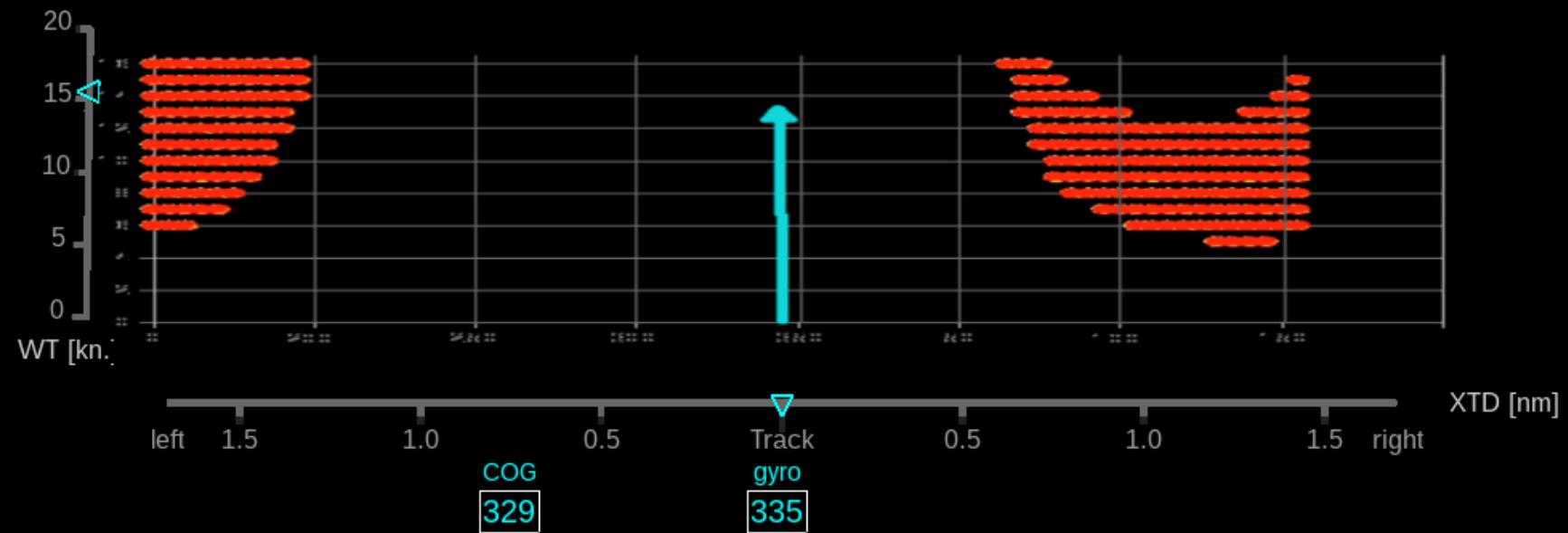
Thank you

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