Here are some of the problems which a racing sailor meets while developing and working-up his boat:

The data that I have recorded are not always reliable!
I haven't got the time to collect data for all the wind strengths from all angles with the different configuration combinations.
I find it difficult to ensure good communication between the architects, sail designers and my project.
How do I communicate my impressions to them?
How do I profit from my experience in how my boat is used?
What are the most realistic working directions?

Questions and reflections like these were the basis for creating Sailects.

To provide answers to these questions various concepts will be used.
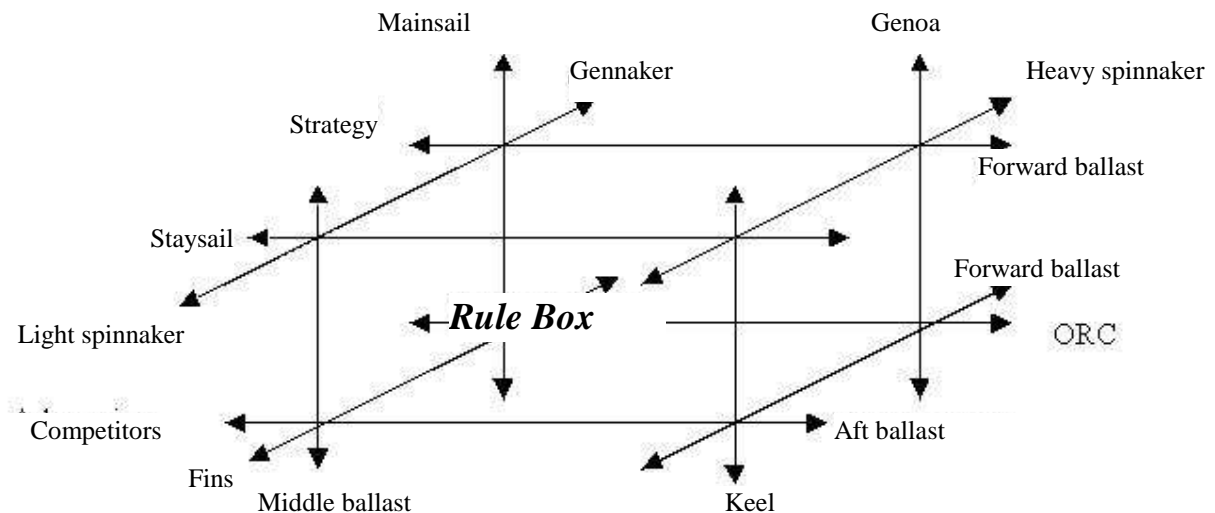

Philosophy

- The idea of a **rule** will be used. A rule can easily be shared by different people and it can be made to evolve. All the rules for the use of one's boat will therefore be defined.
- The basis will be a **common reference system**: the area in which the boat will be used and developed is identified. It will be physically identified so that it does not just remain a concept.
- The experience of racing sailors (of a team) must be used by the different designers involved in my project as a common reference. We start with the user because in the end he will be the one to take the decisions. We seek to put the racing sailor (the main person concerned) at the centre of everything: **sharing experiences.**
- We must start from a **reference base,** common to the various parties involved in the project, which we will confront with reality and then adapt, little by little with targeted adjustments.
- It is necessary to **benefit to the utmost from each person's experience** to help with decisions, both when sailing - when deciding on a configuration and strategy - and as support during development.
- We aim to minimise the risk of taking the wrong decision!

Definition

Area of use of the boat = All the rules which will allow the boat to used to 100% of the knowledge acquired. This is also a starting point for reflecting on the direction of development work.
This area will increase the chances of making correct decisions, or rather of minimising the risk of taking wrong decisions, because the field of action is clearly defined.

Mainsail · Genoa · Gennaker · Heavy spinnaker · Strategy · Forward ballast · Staysail · Forward ballast · Light spinnaker · *Rule Box* · ORC · Competitors · Aft ballast · Fins · Middle ballast · Keel

It is a complex area with a number of parameters which vary depending on the complexity of the boat. It is a useful decision-making tool, however, even on a one-design class boat

Constructing one's starting area

It is unrealistic to create this space from recordings, analysing the data to define the best configuration. This method is very long and there are too many different combinations to test, between the different items of configuration and all the wind conditions. The result will almost certainly be disappointing.

A good starting point is to mix the experience and practical knowledge of racing sailors with the theory of architects and designers.
This has the advantage of bringing the practical knowledge of the racing sailor to the forefront and the combination will serve as a common basis for communication.

Theory → *Starting rule box* ← *Experience*
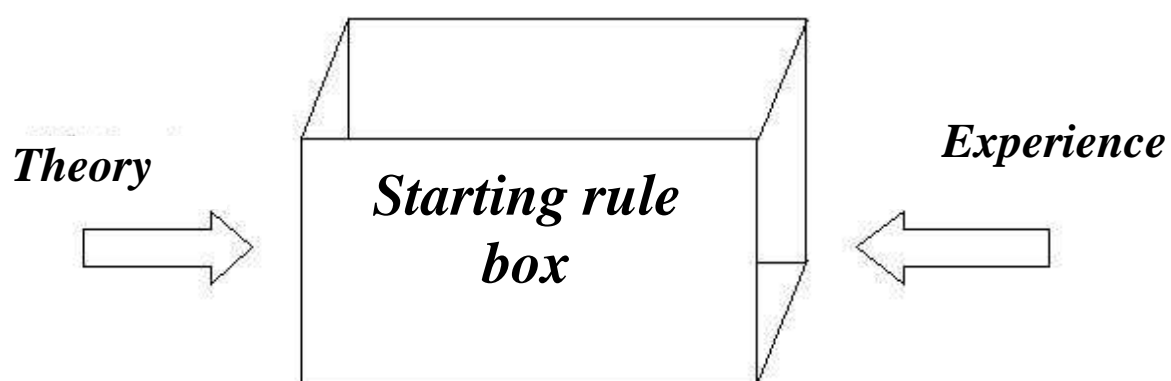
A place of discussion is created.
It is also a starting point for thought for defining the direction of development work.

This basis is ALREADY 80 or even 90% ready, depending on the type of project (new Open or one-design class boat).

It is therefore an aid to decision-making when sailing which already reduces the number of poor decisions. It applies to performance by managing the various configurations, and also to strategy by taking configurations into account in the choice of trajectories. This can be done through route planning, which will directly integrate sail configurations, or by simulating the next heading in your area of use.

This area of use is based on Sailects. It is composed of a distinct set of Sailects.

"I KNOW MY BOAT BETTER, WITHOUT MAKING RECORDINGS, AND I HAVE A TOOL AVAILABLE TO OPTIMISE ITS USE."
Sailects are not based on recorded data but they will be fed by analysing these data.

What is a Sailect?

It is the identity (or use) card of a sail or of an item of configuration.
It is based on a representation of Wind Speed/Wind Angle.

Physically, it is a particular file (extension .se), so it can easily be exchanged via e-mail.
It is both a visualisation and a communication tool.

How is a Sailect created?

We draw the contour intuitively on a speed/angle chart which will then give us various characteristics: colouring, or not, is possible with the whole range of colours, with choice of the type and colour of the contour. This rapid, visual and simple method of creating Sailects also means they can be modified easily. A trace can be kept of sailing impressions and experiences.
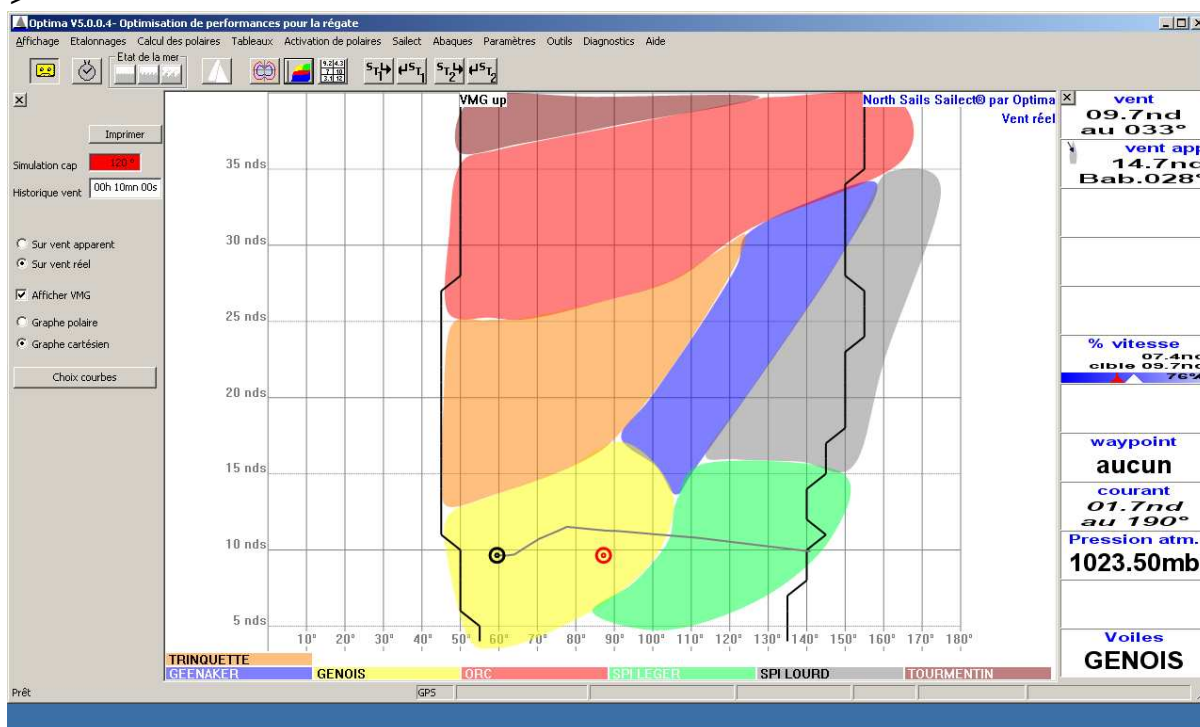
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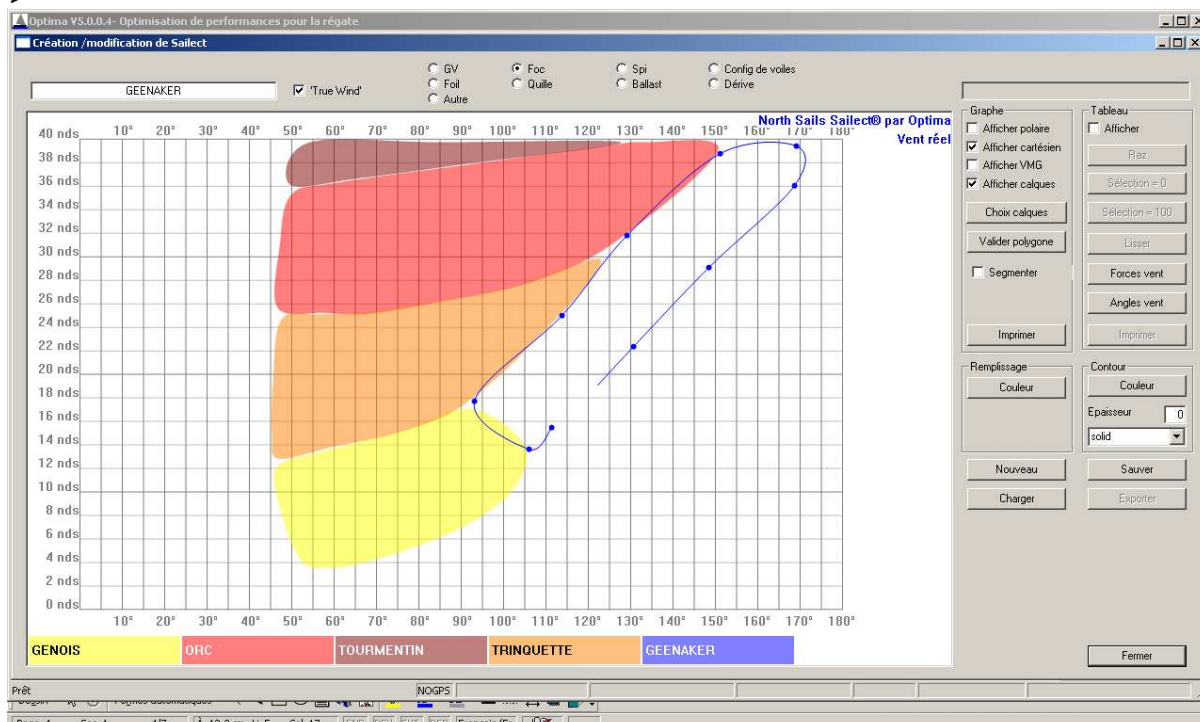
The Sailects displayed serve as references and the contour of the new "GENNAKER" Sailect is drawn point by point. In this example, the Sailect is created by closing the line back to the first point. It can then be characterised with the contour and filling attributes.

Viewing one's Area of Use

The various Sailects can be displayed and the boat's area of use viewed.

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It is possible to display them on the left by type, to sort the layers of information (because there can rapidly be a large amount)

The **black** dot represents the angle of the boat and the present wind strength.
The **red** dot shows the configuration there should be if the heading was 120° e.g. after the waypoint or the next course marker.
The **grey** line represents past history and provides a visual warning of wind trends and their implication for managing the configurations.
At the bottom right, you can see that the sail to use is the genoa.

And the route plan?

When a route plan is simulated, the Legs table shows which sails to use. It is therefore possible to **include the management of my configuration** rapidly and visually **in the choice of my trajectories**. The Legs table will show the various sail changes.
In addition, when simulating a route plan, by displaying the past history of the wind over its duration, the trajectory can be considered relative to the different configurations. Additional information is thus provided for each trajectory which will be valuable for choosing the best route.

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The route planning Legs table shows the sail configuration to use for each leg (last column)
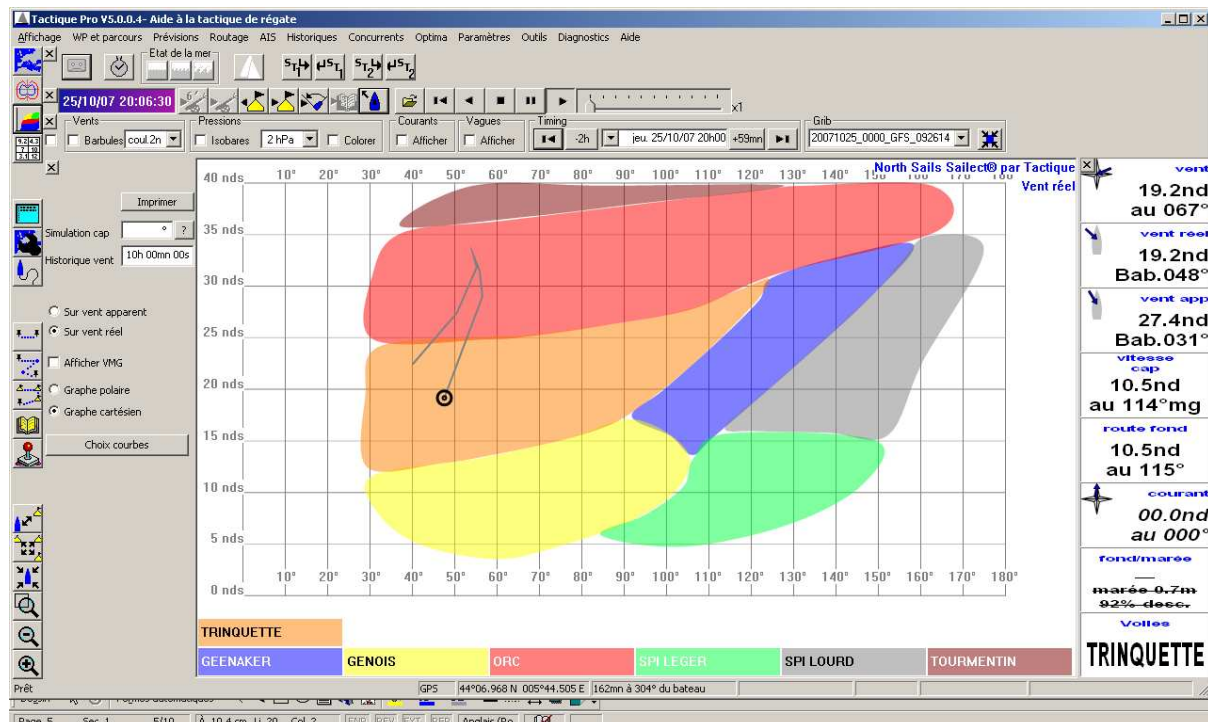
By using the past wind history (in this example: 10 h) on a route plan simulation, configuration management is simplified. This example shows two clear staysail/ORC jib changes. By adding the ballast Sailects or other configuration items, management of the boat can really be integrated into the general strategy.

This approach will also allow routers ashore to integrate use of the boat and thus increase the quality of interaction between the racing sailor and the router.

How do you capitalise on your experience?

During voyages you learn to use your boat from your experience and impressions. This is the most important part of working-up a boat. The majority of decisions concerning the behaviour of the different sails or the adjustment of the centreboard or foils can be confirmed directly on the water. You should therefore capitalise on these decisions.

When visually comparing the "theoretical" Sailect with a new test, you can modify a section of the theoretical contour in line with the conditions under which the test was carried out. This new Sailect will be renamed to create an actual second Sailect. By superimposing the two, the decision (impression) can be seen.

By using the two files **this test or decision can be communicated to others for discussion, or to provide information on how the boat should be used**. After discussion, the new Sailect may become your reference.

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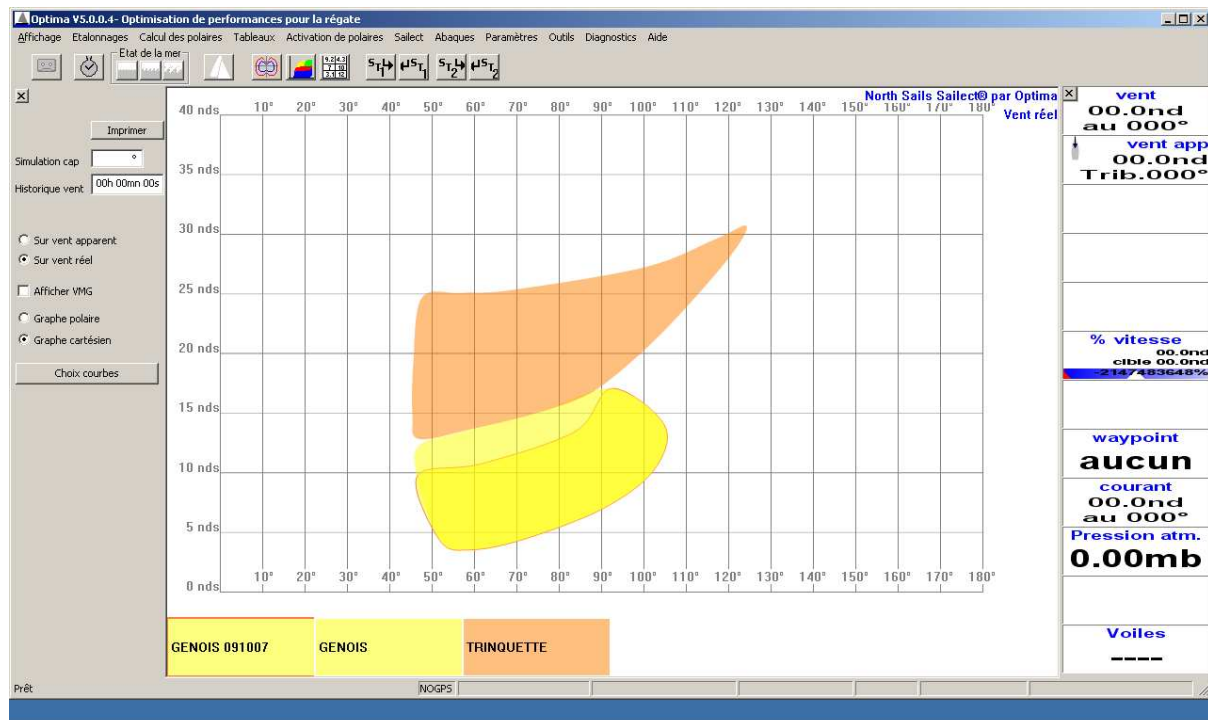
The GENOA 091007 Sailect represents the use of the genoa on 091007 and the impression is that the TWS limit is 10 knots and not 12 knots. Profiting from this experience, the GENOA Sailect (moving some of the points of the contour) has been graphically modified. The staysail Sailect could then be adjusted in the same way as when it was created.

"I have taken decisions, I know my boat better and I am using its potential as well as possible. I have defined a common reference system in which I am working and I can at this stage communicate it. I HAVE STILL NOT RECORDED ANY DATA."

We have started to find answers to our first questions and in particular we can capitalise on and work on our impressions.

Recorded data can now be integrated in this work but with a very precise objective, targeted in the area of use. The result of these tests will be additional to the impressions and the state of the area of use. We will then have 3 elements for taking a decision on the point for a sail change, for example (starting or reference theoretical Sailect; the test/impressions Sailect; test polars).

Development loop

Warnings and thoughts

The use of a tool has its limits.
- There is no magic tool which answers all one's questions.
- The quality of the result is directly related to the quality of one's initial reflection
- When you use a tool, you know what you are looking for: the tool allows you to confirm or back up an impression or experience.

After a starting point has been defined it can be analysed and a set of directions of work determined.

- Is the set of sails consistent with the next objective?
- What are the ranges of use for which doubts exist?
- Is the range of this sail too small?
- Refining the use of ballasts.
- etc.

A number of tests can be performed for all these questions. They must have a well defined description of how they should be carried out. It is best to work in time phases which are also well defined in advance and will allow the different configurations and different adjustments to be covered. Phases should be anticipated where you deviate from the functional point, which will improve the quality of a cross-over (sail change).

It is also important to take notes during these tests for commenting on the conditions under which they were carried out and the impressions on board. They will be important for analysing the results and taking decisions confidently.

TEST PHASE

The test procedure defined will be adhered to and recordings made in which the configurations used will be entered.

Generally speaking, it is better to have less data but data that you are sure are valid (good conditions for sailing, adjustments and recording). The sailor must trigger the recording phases, so that recording is not just by default, i.e. leaving Optima to record continuously. Were that the case, updating the configuration of your boat would be difficult. There would be a risk of obtaining recorded files with a great deal of redundant, unreliable or even false information.

A Sailect for the test can be created according to impressions on board.

FEEDBACK

The different elements are collected together:
- The file of recorded data
- Statistics on the data files
- Conditions when carried out
- Impressions
- The test Sailect

Optima extracts the various configurations encountered from the data files and calculates the respective polars. When viewing the different polars simultaneously, cross-over points (TWS/TWA) between two sails appear.

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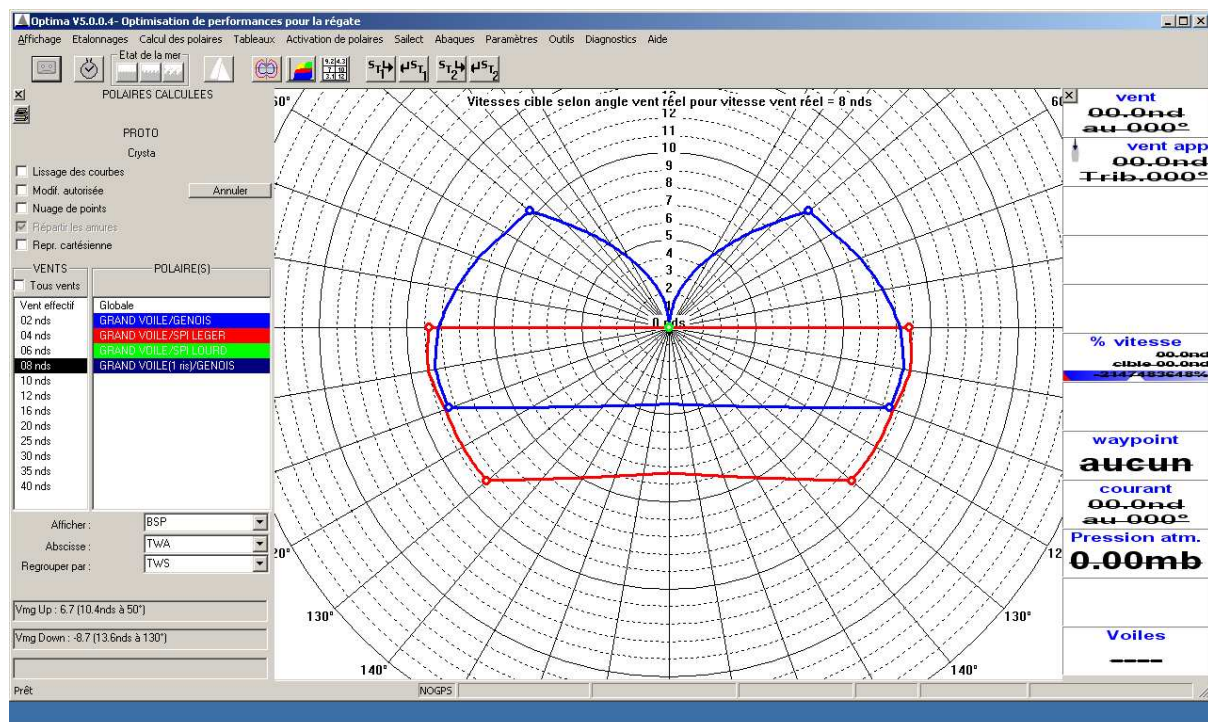
The different polars from the recordings can be viewed and notable points sought.

This table shows the best configurations. The Sailect concept is close and comparison with the reference Sailects shows that modifying them graphically is sufficient. In this example, the GENOA Sailect could be modified as a result of these recordings for the true wind values of 4, 6 and 8 knots.
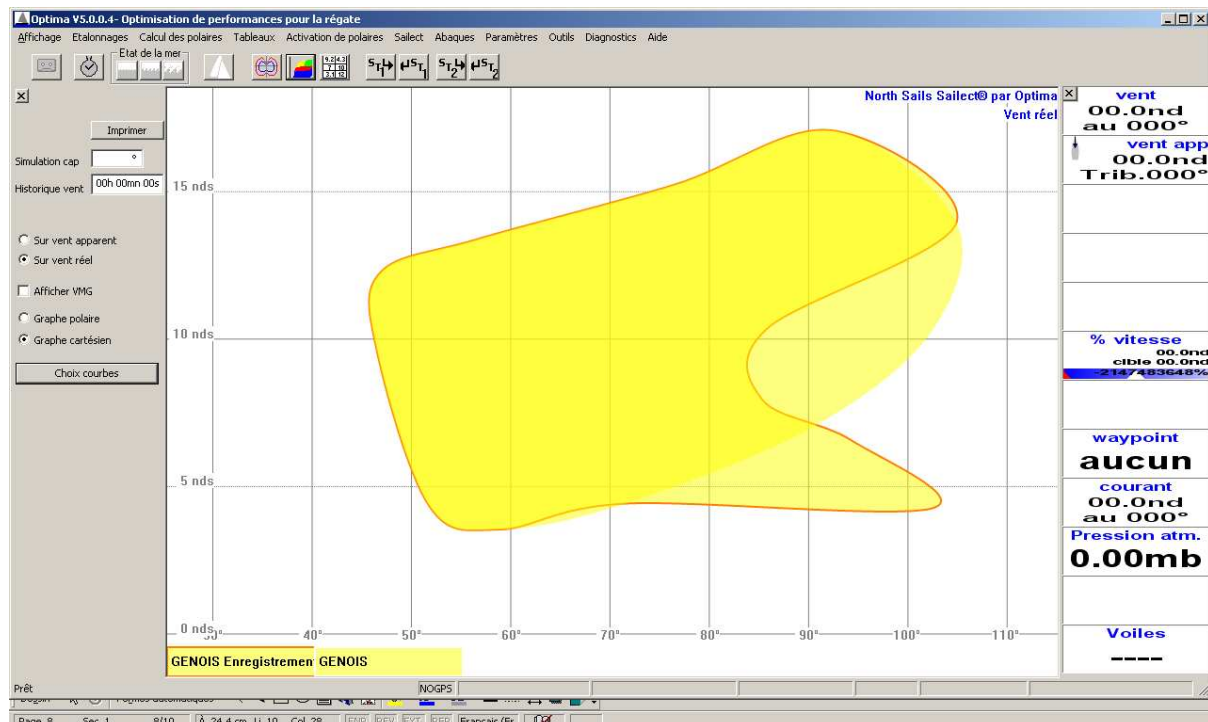
Superimposition of the GENOA reference Sailect on the one recorded. The new reference Sailect must then be confirmed.

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Each configuration is shown in terms of percentage efficacy relative to the reference polar.

TAKING THE DECISION

The aspects to take into account are:
- The starting area of use with its Sailects
- Sailects from tests
- Test polars
- Accompanying impressions

- Replay function if necessary

By comparing all these items a decision can be taken on the choice of one configuration over another or a functioning point can be confirmed or adjusted or a cross-over confirmed.
There may be a decisive element among the above but they must all be given the same importance when they are considered.
This comes back to superimposing the different Sailects, physically.

"THE VALUE OF THE RECORDED DATA INCREASES BECAUSE IT IS SPECIFIC AND IDENTIFIED; IT HAS GAINED IN CREDIBILITY SINCE MY FIRST COMMENT WHICH WAS THAT I HAVEN'T ANY CONFIDENCE IN MY DATA."

This process based on the Sailects and the physical representation of the use of various configurations can be applied to producing performance or routing polars. **Start from a theoretical polar and feed in the different values from successive trials**. You should not hesitate to make manual adjustments thus adding your knowledge and impressions. This will be time well spent and give **confidence in using this polar as a real reference and important factor in assisting decision making**.

Sailects can be used with all types of boat. There are different degrees of use depending on the onboard computer possibilities. How the Sailects are used will depend on the type of boat. A one-design class boat where the area of use will quickly be close to 100% will mainly use Sailects for viewing and taking rapid decisions while sailing. The development and work-up of a new boat will use Sailects as a learning aid and for development decisions, later becoming an aid for sailing decisions. In all cases, however, it is a means of capitalising on experience, a help in the development and work-up of your boat.