

## Instructions for use of Blast viewer, BETA.

The software is a fully portable version, so it does not need installation.

When open the file we will find the main window of the software and a demo calculation already loaded:

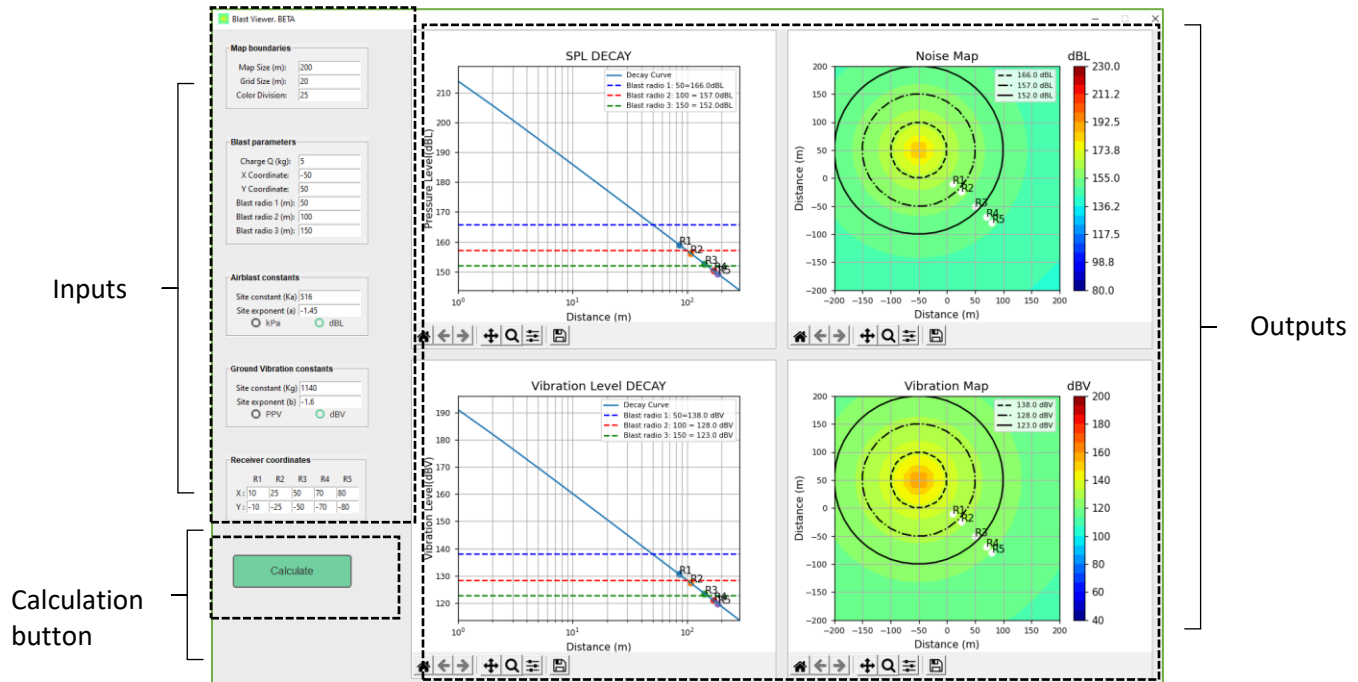


Figure 1: The main software window

The main screen is divided into 3 main frames, these are:

- Inputs: Map boundaries, Blast parameters, Airblast constants, Ground Vibration constants y Receiver coordinates.
- Calculation button
- Outputs: Graphs and maps for Airblast Overpressure and Ground Vibration.

In the inputs section it consists of 5 sub-frames which correspond to the data input. Looking in more details:

1. Map boundaries: To calculate the limits and parameters of the noise and vibration map.

**Map boundaries**

Map Size (m):	200
Grid Size (m):	20
Color Division:	25

Figure 2: Frame for map boundaries and parameters.

Using the same parameters let's analyze the following example:

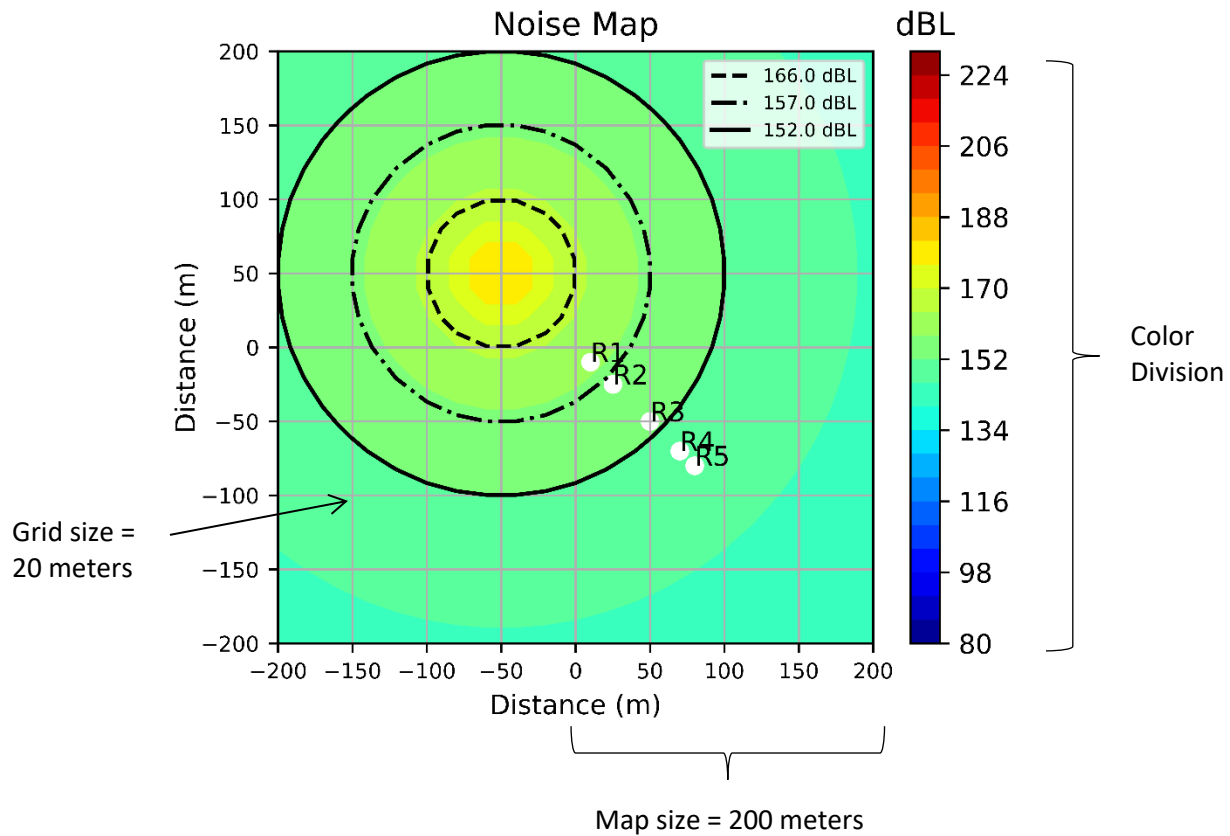
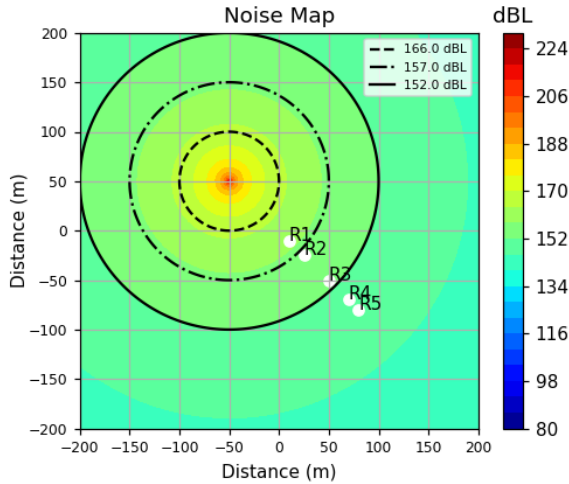


Figure 3: Frame noise map and parameters.

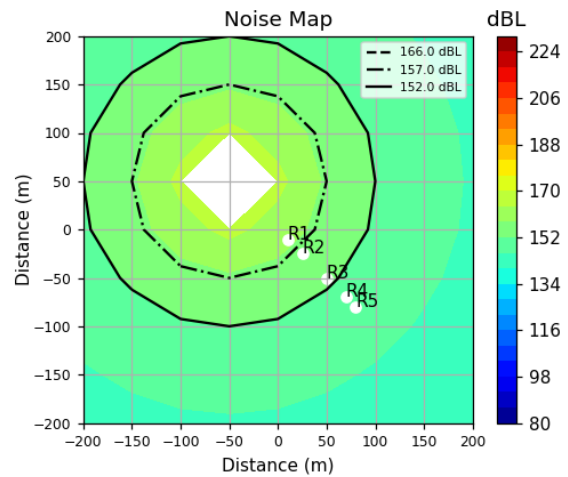
When looking at Figure 3 you can see that Map size establishes dimensions of the plane at 200 meters from the origin (0, 0) of the map, this means that they will be 200 towards both directions of each axis:

$$\text{Dimensions} \begin{cases} x: & -N : N \\ y: & -N : N \end{cases} \rightarrow \begin{matrix} -200 : 200 \\ -200 : 200 \end{matrix}$$

In the case of Grid size, it establishes the resolution and distance between each calculation point of the map. This is shown in the fact that a Grid size = 1 meter will have the highest possible resolution while the larger Grid size will have less resolution.



(a) Grid size = 1 meter ; Map size = 200 meters

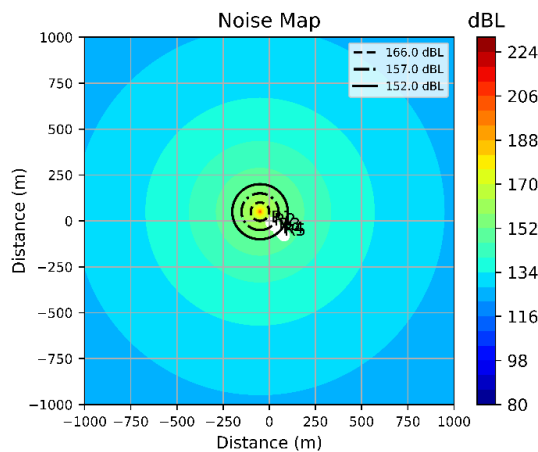


(b) Grid size = 50 meters ; Map size = 200 meters

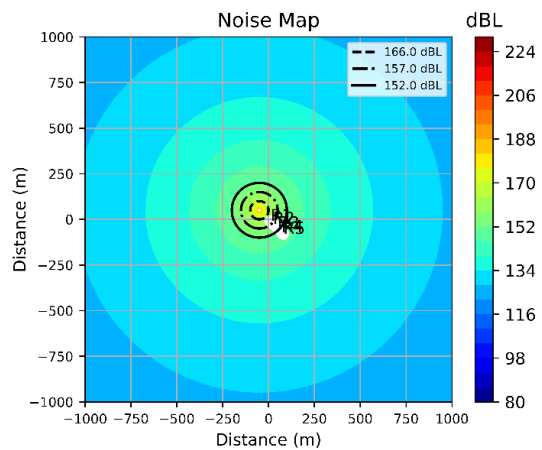
Figure 4: (a) Small Grid size , (b) Big Grid size.

Looking at Figure 4.a shows a high resolution while Figure 4.b has a lower resolution. The latter comes to have square edges coinciding with the first calculation points around the source at a distance of 50 meters.

Keep in mind that a very small Grid size and very large Map size will perform too many calculations using a large consumption of ram so it will take longer, this is risky since the program can crash. In addition, if the evaluation were carried out at a long distance, it does not make sense to use a small value.



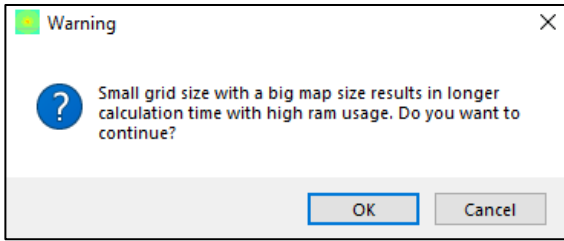
(a) Grid size = 1 metro; Map size = 1000 metros



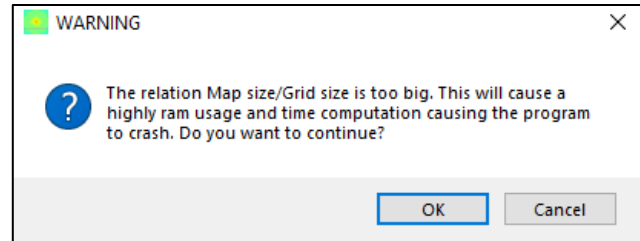
(b) Grid size = 10 metros; Map size = 1000 metros

Figure 5: (a) Small Grid size, (b) Big Grid size.

When the Map size is 1000 times larger than Grid size a warning message will appear indicating more ram consumption, while if it is 10000 times larger a warning message appears that the program is likely to crash, so it is not advisable.



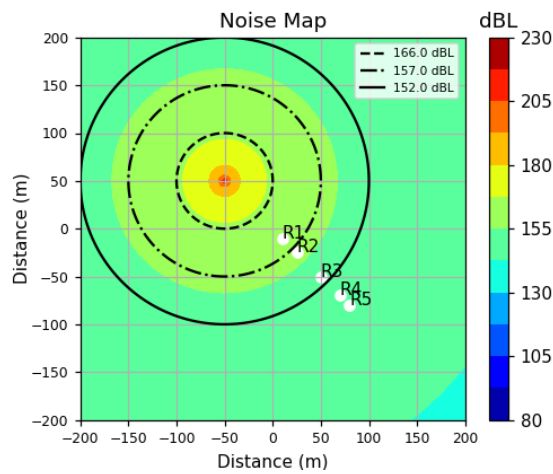
(a) Map size/Gride size warning message  
> 1000



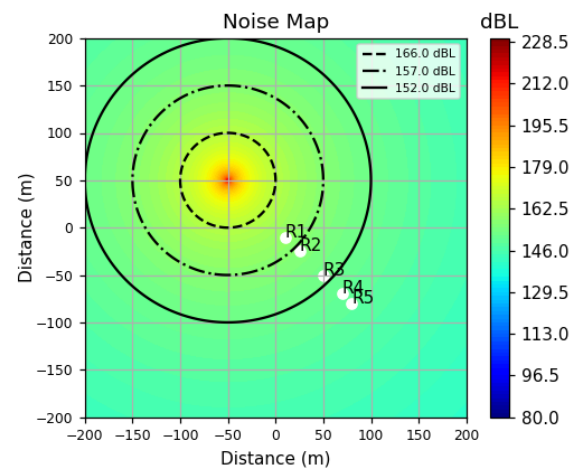
(b) Map size/Gride size warning message >  
10000

Figure 6: Warning messages.

The Color Division parameter is for setting the number of colorful outlines.



(a) Color division = 12



(b) Color division = 100

Figure 7: (a) Small Color division, (b) Big Color division.

It should be noted that the limits of the levels are predefined in the algorithm and cannot be modified.

2. Blast parameters: To enter the parameters regarding the charge.

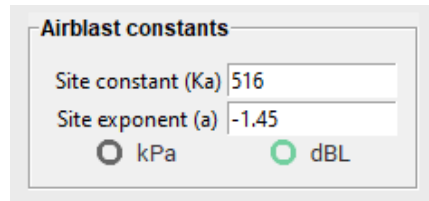
 A form titled "Blast parameters" with several input fields:
 

- Charge Q (kg): 5
- X Coordinate: -50
- Y Coordinate: 50
- Blast radio 1 (m): 50
- Blast radio 2 (m): 100
- Blast radio 3 (m): 150

Figure 8: Frame load parameters.

The parameter Charge Q corresponds to the weight of the charge which is in kilograms, while X coordinate and Y coordinate are the x,y coordinates for the respective charge. The Blast radius 1, 2 and 3 are for setting calculation radius for the load respectively.

3. Airblast constant and Ground vibration constants: corresponds to the site constants, either for climate or for type of terrain.



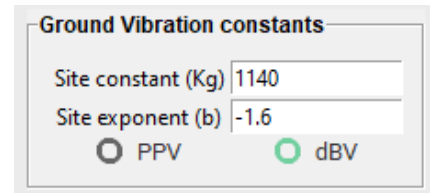
**Airblast constants**

Site constant (Ka)

Site exponent (a)

☐ kPa ☒ dBL

(a)



**Ground Vibration constants**

Site constant (Kg)

Site exponent (b)

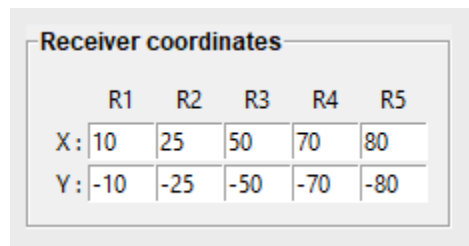
☐ PPV ☒ dBV

(b)

Figure 9: (a) Frame for site constants for Airblast overpressure, (a) Frame for site constants for Ground vibration.

Both frames are composed of their site constants (Ka, a, Kg and b) and two radio buttons each to choose the unit in which the result is displayed.

4. Receiver coordinates: To enter the x,y coordinates of each receiver.

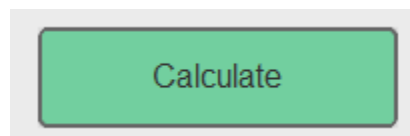


**Receiver coordinates**

	R1	R2	R3	R4	R5
X:	10	25	50	70	80
Y:	-10	-25	-50	-70	-80

Figure 10: Frame for receiver coordinates.

When filling in each desired parameter just press CALCULATE button to display the result.



Calculate

## 5. Toolbar

Each chart and map have a toolbar that allows you to interact with it.

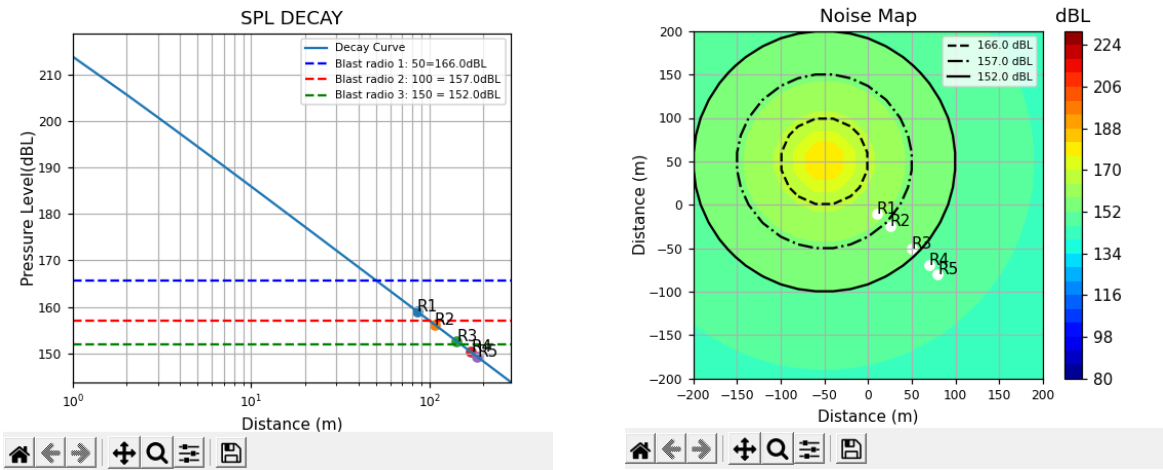


Figure 11: Toolbar at the bottom.



: Allows to return to the original version.



: Allows to move to different versions.



: Moves left, right, up, and down.



: Zoom in. \*It is advisable to make a "square" selection.



: Allows to modify width and height.



: Allows to save graphics as an image in different formats.

**For further information contact: [janorios.matias@gmail.com](mailto:janorios.matias@gmail.com)**