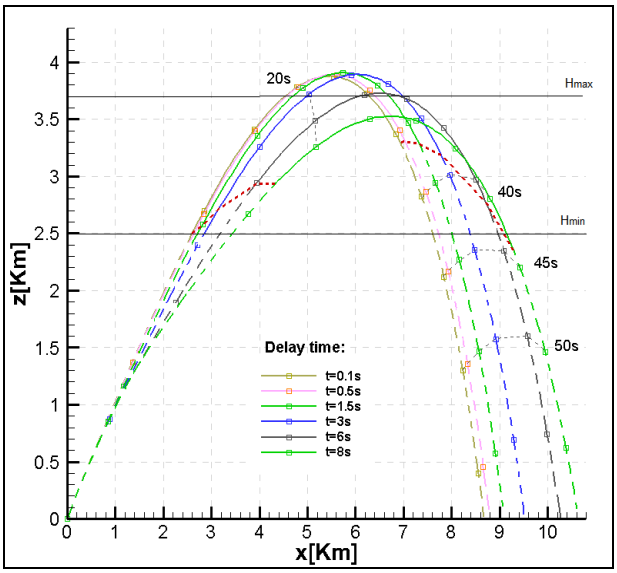

Fig. 8 Trajectories for 50^0 launching angle

In fig.7 and fig.8 it is highlighted the displacement of both the starting and ending moment of seeding. We can observe that the trajectory is longer and lower when the delay time is increased.
From fig. 9 it is obvious that the active length of the trajectory is increasing with the delay time, but as shown in fig. 10 the active trajectory between isotherms does not have the same tendency. This indicates that the limitations imposed by altitudes are an important and sensitive factor in formulating and solving the problem.

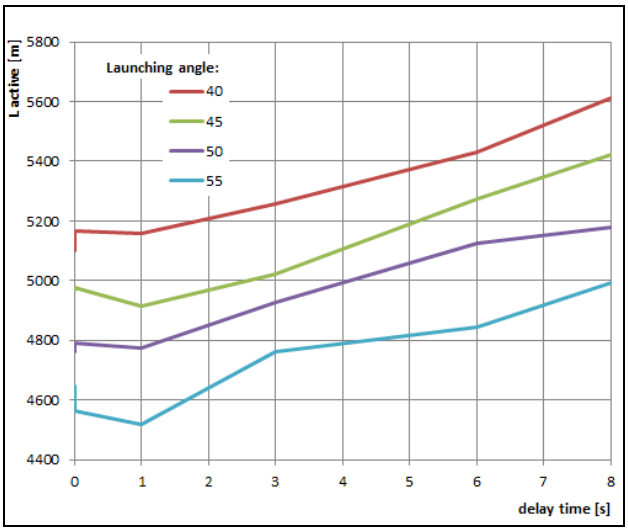

Fig.9 Active trajectory length function of delay time

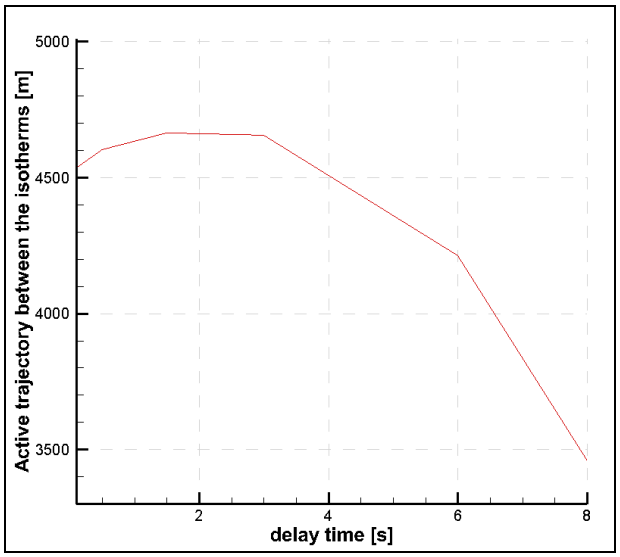

Fig.10 Active trajectory between isotherms function of delay time for 45^0 launching angle.

Analyzing fig. 10 we can observe that there is an optimal delaying time (around 2s) that maximizes the effective active trajectory between the chosen isotherms for 45^0 launching angle.
We introduced some dimensionless indicators:

- **Efficacy performance** refers to how much in percentage from the active seeding part of the trajectory satisfied the first constrain of the problem, that means it is in the area of interest between the two isotherms.
- **Individual performance** refers to how much in percentage from the rocket trajectory between the two isotherms is also an active seeding part of the trajectory.
- **Global performance** refers to the effective active seeding part of the trajectory of a particular rocket relative to the maximum calculated value of the active area. It is an indicator that will classify the cases studied relative to the best result obtained. It is also expressed in percentage.

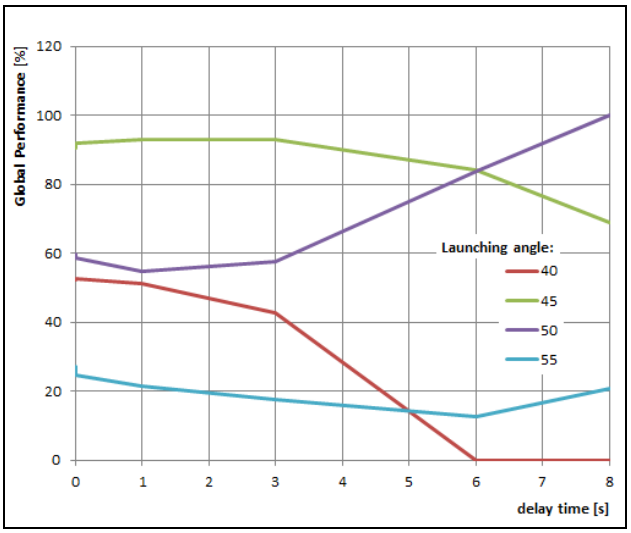

Fig.11 Global Performance function of delay time

We can observe from fig.11 that the global performance is higher for the launching angle 45^0 until a certain delay time (6s) when 50^0 becomes more effective.

4 Conclusion

The delay time offer a useful instrument to control in a limited way the trajectory profile.

There is an optimum delaying time that ensures a maximum length for the active trajectory inside the two isotherms.

As we can see from the Table 3 the individual performance can be 100%, and still the efficacy performance could be small (40%), like for case 4 with an initial launching angle of 40^0.

Another important result is for case 6 for an initial launching angle of 50^0. In this case we obtain the longer effective active part between isotherms.

The analyze of the indicators allows to correctly set the self-destruction mechanism, and on the other hand to choose the most advantageous trajectory reported to the concrete atmosphere thermal stratification of the day.

In hail combat action a calculated number of rockets will be launched in order to cover the volume of the cloud with a high potential of hail forming. For an increase of the rocket efficacy - the efficiency of the hail combat process will be increased. A higher efficacy means to obtain similar results with a smaller number of rockets that will reduce the operation costs.

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Abbreviations

SRM - Solid propellant Rocket Motor

t_{b1} – Burning time for grain no. 1

t_{b2} – Burning time for grain no. 1

t_s – Seeding duration

L act - Active length is the length of the seeding part of the trajectory

L ideal- the ideal length is the length of rocket's trajectory between the two isotherms

Lact eff – the effective active length isthe length of the seeding part of the trajectory between the two isotherms.

Eff. Perf - Efficacy performance

Indiv. Perf - Individual performance

Glob Perf - Global performance