

Real-Time Dust Detection System



An optical technology able to monitor dust clouds in real time

Actual Situation

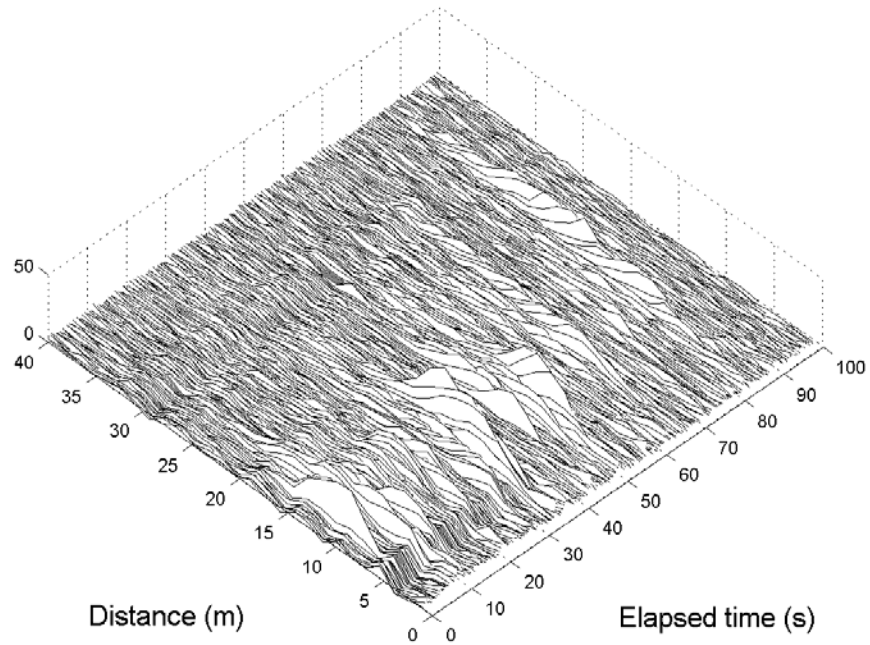
Quarrying activities and various residential or road construction sites in urban zones are often a source of fine particle emission susceptible to be windblown into residential zones. Their monitoring requires installation of a sampler network expensive to install and operate since it requires that data interpretation be done in a laboratory specialized and certified in particle analysis. Furthermore, its range is limited to a few square meters and, since the data is collected several days later, the current procedure only gives an average of dust particles issued during the data gathering time period. Therefore, we cannot know the exact day or the precise time duration of dust emissions greater than the standard ones accepted by the Department of Environment, nor can we correct in real time the dust drift.

Innovation

A remote sensing device, able to scan the neighboring areas of the work stations, has been developed. This device, equipped with a 360-degree radius of action and a more than 50 m range, allows determining the relative concentration of particles suspended in the air in order to establish mapping of the cloud progression. Moreover, this user-friendly device allows for several workdays of data to be saved on a simple USB key.

Field Tests Results

Preliminary quarry tests permitted to validate the device's very high sensibility. The following figure shows that it is possible to follow in real time several drifts of dust clouds in the air. The drifts starting at 65 seconds and 82 seconds are quite noticeable. Moreover, the one starting at 82 seconds is particularly interesting because it covers a distance of approximately 25 m and lasts for about 6 seconds. Its speed has been estimated at 16 km/h and its signal amplitude is proportional to the dust concentration suspended in the atmosphere.



Conclusion

The cost, ease of installation and user-friendliness of this new device make it possible for a multitude of utilization opportunities. For example, in the future, it will be possible to monitor the efficiency of different ventilation systems, external or internal work areas, etc.

As soon as a trade agreement and/or technological transfer are concluded, the device will be available on the market.

For more information on this new technology or other INO projects, please visit www.ino.ca