

## 2D3) Fog Removal by Using Horse Hair

Chang-Jin Ma · Mikio Kasahara<sup>1)</sup>

Faculty of Human Environmental Science, Fukuoka Women's University, Japan

<sup>1)</sup>Institute of Science and Technology Research, Chubu University, Japan

### 1. Introduction

Due to the stable meteorological conditions high concentrations of pollutants can be reached in the fog droplets leading to potential damage on vegetation. Reduced visibility during dense fog causes a lot of fatalities and injuries in traffic as well as expensive equipment failures or delays. In order to remove fog, a noble action was attempted in the present study. Here, we briefly report a part of de fog experiments.

### 2. Methods

We developed the unique defogger instrument by using horse hairs and blower. Both small(flow rate:  $8.64\text{m}^3/\text{min}$ ) and large(flow rate:  $1,300\text{m}^3/\text{min}$ ) scale types of defoggers were made for laboratory and field experiments. Our defog project was designed according to three circumstances, namely, fog appearance at enclosed space like an vinyl house, a large scale duct(Fig. 1), and opened spaces such as a express highway, a sports stadium, a airport, etc.

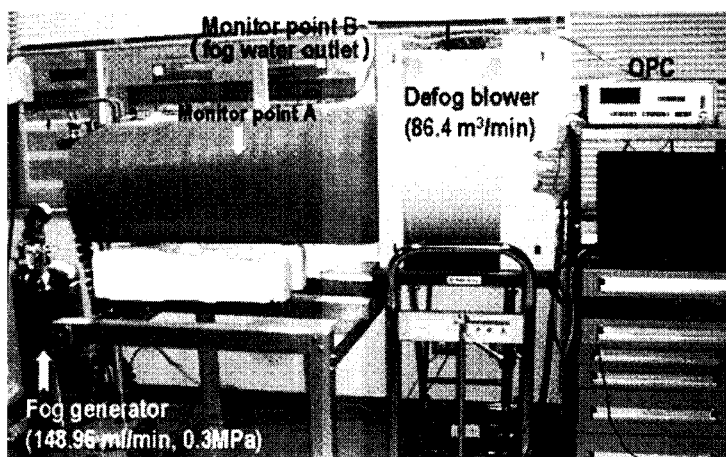


Fig. 1. Laboratory experimental set up for fog(supposed acid mist) removal from inner duct.

### 3. Results and Discussion

De fog rate calculated from the laboratory experiment at a clean room( $W5.95 \times L5.10 \times H2.40$ ) was up to 75%(except gravitational deposition) for only 2 minutes operation of the vent defog blower with horse hairs. In particular, in the case of duct experiment, de fog(mist removal) rate estimated from the variation of number concentration for droplets larger than  $5\mu\text{m}$  was up to 99%. Our laboratory studies have shown that horse hair, which is hydrophilic in nature, can absorb aqueous fog droplets, and then release them as fog water through the vent-defog blower. However, although visibility was improved while our de fogger blower was running, the further effort was required for the effective fog removing at outdoor.

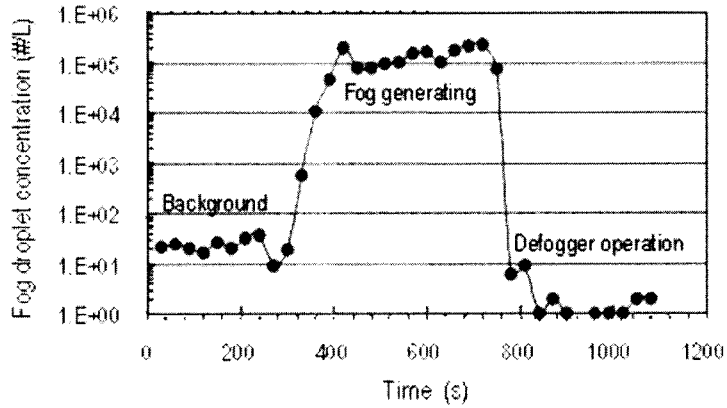


Fig. 2. Variation of fog droplet number by our defogger operation in a duct experiment.

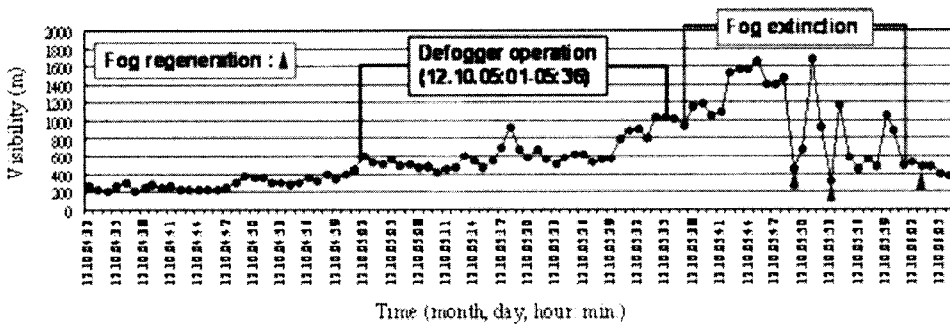


Fig. 3. Variation of visibility measured at 18m distance from rear of defog blower.

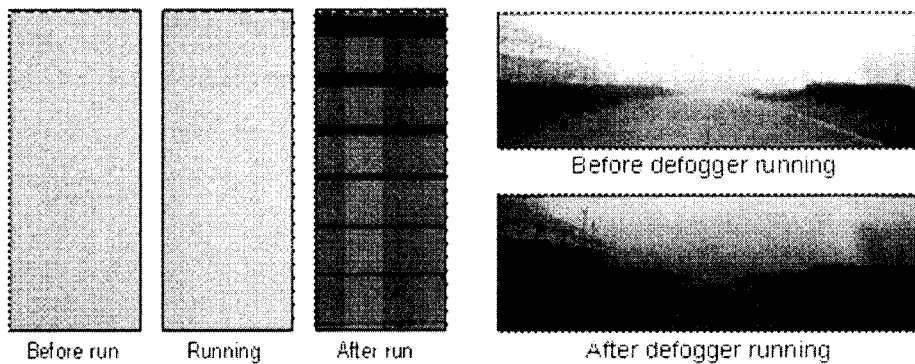


Fig. 4. Views of visibility index during laboratory(left 3-index) and field(right two sceneries) defog experiments.