

MITIGATION - SCIENCE AND TECHNOLOGY ADVANCES FOR CHEMICAL AND BIOLOGICAL HAZARD MITIGATION

Development Of Aerosol Decontamination Module For Autonomous Indoor Decontamination System

Kyeong Min Cho Agency for Defense Development **Sang Myeon Lee** Agency for Defense Development **Eunmee Goh** Agency for Defense Development **Heesoo Jung** Agency for Defense Development **Hae Wan Lee** Agency for Defense Development

With a reduction in a manpower, the complexities of infrastructure and safety concerns of operators, autonomous decontamination of indoor spaces has grown a significant interest for future application. Among various decontamination methods, aerosol delivery of decontaminant stands out as a promising candidate due to its efficacy in remediating contaminated infrastructure, compatibility with building materials and devices, and flexibility in operation size and environmental conditions compared to decontamination using oxidizing gases.

In this study, we have developed an aerosol decontamination module capable of generating dry fog and electrical charges if desired. The use of dry fog prolongs the duration of exposure over the treated space, effective in knock-down of biological particles while also extending the delivery distance of decontaminants. Additionally, the application of electrical charges to the aerosol enhances deposition rates within complex indoor spaces and on equipment surfaces. Despite the availability of various types of dry fog generators, their utilization in autonomous decontamination modules has been limited by requirements for large air consumption, high air pressure, and power consumption. We conducted decontamination tests using biological indicators to design and optimize the aerosol decontamination module for integration into our autonomous decontamination system. The aerosol device will be deployed on a cooperative UGV-UAV platform for wide-area and complex indoor decontamination.

This research is funded by the Agency for Defense Development of Korean Government (912A08001)