

The CUNY Center for Advanced Technology In Photonics Applications (CUNY CAT)
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Modular Scale Model NYC Transit Subway Station With Particle Image Velocimetry Biochemical Agent Transport

Project goal: Measure the flow field and the dispersion of a Biochemical Agent (BCA) surrogate in the subway station environment to estimate exposure to riders and workers. Future studies will probe the role of forced vs. natural convection on exposure, and methods of BCA containment.



Key Scale Model Features:

- 1:48 scale model of NYC MTA C line 135th St station
- Includes an automated MTH Premier R-40 8-Car train set that runs along Atlas O-40 rigid track
- Modular station design includes 2 tracks (1 removable), 2 platforms, multiple stairwells (all removable) and multiple columns (all removable)
- Surrogate BCA generated and released via up-tunnel flow and at specific locations along track



Key PIV Features:

- Used to measure flow field and surrogate BCA dispersion in station
- Includes a Nd:YAG 532 nm laser articulated using a light arm into a 6" to 12" square light sheet, and a high speed camera and processor while collects images on a ~16ms frequency

Model Dimensions	Actual	Model
Overall Length	410'-6"	8'-6"
Distance Between Track & Ceiling	14'-6"	3 5/8"
Distance Between Platform & Ceiling	10'-0"	2 1/2"
Tunnel Length Before & After Station	528'-0"	11'-0"
Train Width	8'-6"	2 1/4"
Track Width	10'-5"	2 5/8"
Track Spacing	1'-6"	3/8"x3/4"
Platform Height	4'-5"	1 1/8"
Platform Width	12'-0"	3"
Column Outer Width	1'x1'x10'-0"	1/4"x1/4"x2 1/2"
Column Inner Width	1'x1'x15'-0"	1/4"x1/4"x3 3/4"
Spacing to Adjacent Column	15'-0"	3 3/4"
Staircase Dimensions		
Overall Height	10'-0"	2 1/2"
Footprint Width	6'-6"	1 5/8"
Footprint Length	15'-6"	3 7/8"
Distance to Adjacent Staircase	102'-0"	2'-1 1/2"

This technology opportunity sheet describes continuing efforts in this area. Several patents may have been issued or are pending and which may be available for licensing.

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