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ALBA synchrotron tunnel HVAC system review

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The storage ring is feed from a full-energy 249.6 m booster ring preceded by a 100 MeV LINAC that acelerates electrons from a 100KeV electron gun.

The electron gun, the LINAC, the booster ring and the storage ring are enclosed in a high density BaSO4-filled concrete bunker (tunnel-like) provided with a high capacity dedicated HVAC system aimed to keep temperature stable within a very narrow range (whatever the thermal load generated by the accelerators). In order to reach this very demanding thermal regulation, the design and distribution of the air nozzles inside the tunnel is a key factor.

After ten years of operation, it's time to review how this air distribution inside the tunnel is performing. By checking the air flow inside the tunnel (and indirectly, the map of temperatures) it will be possible to make this process more reliable during operation.

In order to perform this test, a visual tool has been used. Some smoke (from a standard smoke machine) has been pumped into the air ducts, allowing us to visually check the air flow and its turbulence.

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