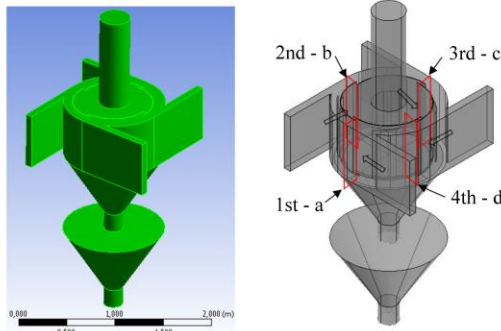


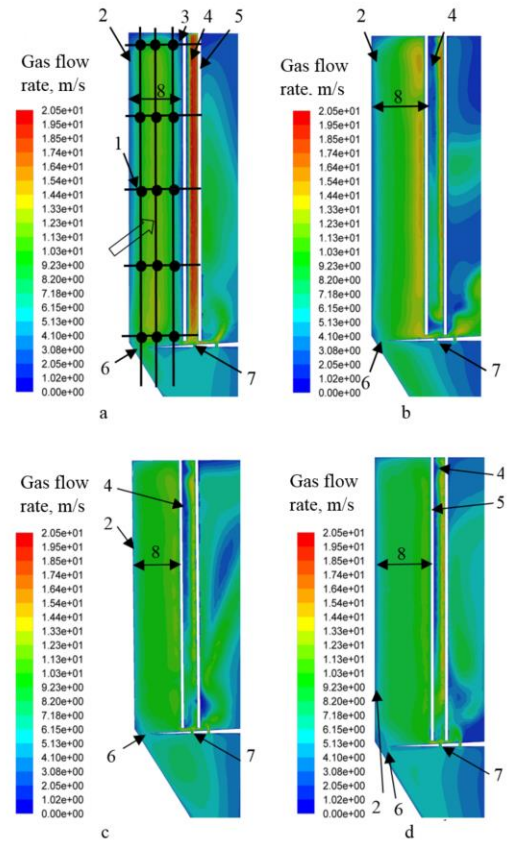
# Supplementary Materials

## Graphic Abstract

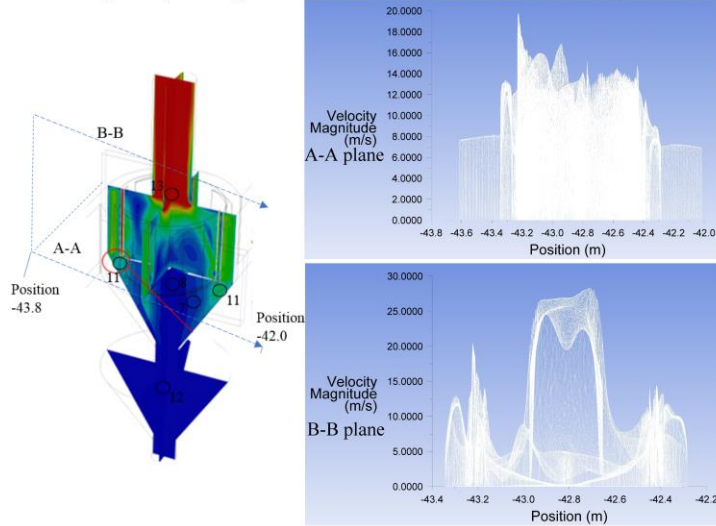
A pilot multi-channel cyclone and numerical model



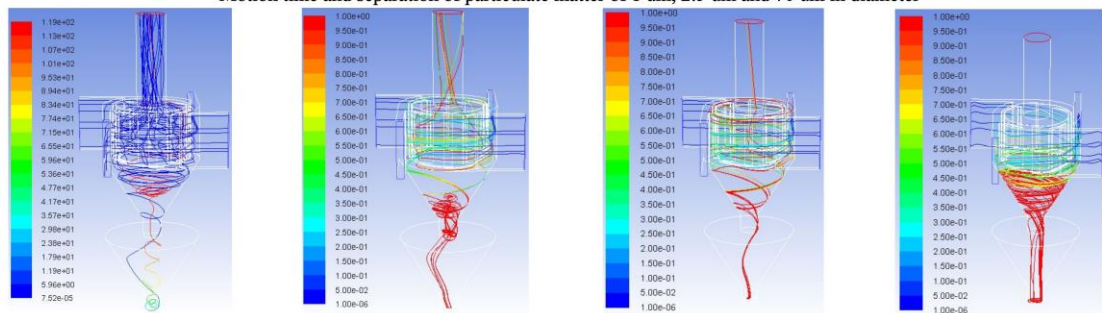
Gas flow rate in advanced multi-channel cyclone in channels



Secondary inlets, low roughness of inner surface, convex bottom, inner apertures



Motion time and separation of particulate matter of 1  $\mu\text{m}$ , 2.5  $\mu\text{m}$  and 70  $\mu\text{m}$  in diameter



## **Highlights**

Aerodynamic and particulate matter motion in a secondary inlet multi-channel cyclone-separator were investigated.

k- $\omega$  SST viscosity model at aggressive conditions and specific surface roughness were used.

The relative residuals of the gas flow rate values were varied from 4.3 to 17.6%.

The separation efficiency obtained experimentally and based on numerical model are varied less than 15% and equals to 11.8%.