Investigating the behavior of anisotropic RANS model Rij-ε (Launder et al., 1975) for dispersion of a pollutant in low wind stable conditions, using a 3-D CFD code, Code_Saturne® (EDF).

Comparison with the standard k-ε model (Launder & Spalding, 1974).

Prediction percentage of overall observations within a factor of two:
- 38% for Rij-ε
- 35% for k-ε

Better prediction of overall peak concentrations by Rij-ε model ↔ Better representation of the anisotropic turbulent flow

Objective ➔ Dataset for validation ➔ Numerical setup ➔ Comparison of models ➔ Conclusion

Idaho Falls field experiment (Sagendorf & Dickson, 1976):
- Run 10 (duration: 49 min)
- Variable wind direction
- 360° sampling grid, 180 positions of receptors

\[
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ Rij-} \varepsilon = 1.84 \\
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ k-} \varepsilon = 3.36 \\
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ Rij-} \varepsilon = 0.81 \\
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ k-} \varepsilon = 1.37 \\
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ Rij-} \varepsilon = 0.60 \\
\frac{C_{p,\text{peak}}}{C_{o,\text{peak}}} \text{ k-} \varepsilon = 0.97
\]