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Nota di contenuto	Concentration Fluctuations and Averaging Time in Vapor Clouds; Contents; PREFACE; ACKNOWLEDGMENTS; 1. Background and Objectives; 2. Sampling and Averaging Time Definitions; Calculating Mass-Weighted Sampling Time; Effective Sampling Time ts,a for Block Time Averages; 3. Effect of Averaging Time on Mean Calculations; Ensemble Averaging and Zero Sample Time Meandering; Field Data for Sampling and Averaging Time Effects; Plume Spread Sampling Time Effects Deduced from Velocity Fluctuation Statistics; Measurement of Crosswind-Velocity Sampling Time Exponent pv Averaging Time Effects on Plume Spread yRandom Force Model for Sampling Time Effects on Crosswind Spread; Comparing the Random Force Model to CONDORS Data; Comparing the Random Force Model

with y ~ ts0.2; 4. Concentration Fluctuation Modeling; Overview; Types of Concentration Fluctuation Models; Conditional Statistics for Fluctuation Calculations; Wind Tunnel Simulation versus Field Testing for Model Validation; 5. Probability Distributions; Exponential Probability Distribution; Clipped-Normal Probability Distribution; Log-Normal Probability Distribution; Gamma Probability Distribution Recommended Probability Distribution and Conditional Intensity Functions6. Release Height and Source Size Effects on Fluctuation Intensity; Internal Fluctuations in Jets and Plumes with No Meandering; Fluctuation Intensity in Meandering Plumes from Ground Level Releases; Meandering Plume Models for Source Size Effects on Elevated Releases; Comparison with Chatwin and Sullivan's Similarity Model; Release Momentum Effects on Source Size; Fluctuations Near the Ground: Dissipation by Wind Shear; Terrain Roughness, Atmospheric Stability, and Compatibility with Existing Hazard Assessment Models 7. Source Density Effects on FluctuationsDense Plumes; Buoyant Plumes; 8. Buildings and Obstacles; Modeling Concentration Fluctuations in Building Wakes; 9. Threshold Crossing and Peak Levels; Time Sequence versus Ensemble Repeat Averages; 10. Framework for an Operational Model; Adjusting Mean Concentration for Averaging Time; Concentration Fluctuation Statistics; Concentration Fluctuation Intensity; Fraction of Time Threshold Concentration Is Exceeded; Once-per-Event Peak Concentration; Summary
Appendix A Averaging and Sampling Time Effects on Plume Spread Velocity and Concentration FluctuationsInertialess Fluctuation Spectrum; Concentration Fluctuations; Power Law Exponent qc for Averaging Time; Effect of Averaging Time on Concentration Variance; Effect of Sampling Time on Concentration Variance; Power Law Exponent pc for Increased Sampling Time; Velocity Fluctuations; Sampling Time Effects on Crosswind Velocity Variance; Sampling Time Effects for the Transverse Isotropic Spectrum; Averaging Time Effects for Finite Sampling Time; Gifford's Random Force Model for y Wilson's Power Law Approximation to Gifford's Random Force Model

Sommario/riassunto

This book contributes to more reliable and realistic predictions by focusing on sampling times from a few seconds to a few hours. Its objectives include developing clear definitions of statistical terms, such as plume sampling time, concentration averaging time, receptor exposure time, and other terms often confused with each other or incorrectly specified in hazard assessments; identifying and quantifying situations for which there is no adequate knowledge to predict concentration fluctuations in the near-field, close to sources, and far downwind where dispersion is dominated by atmospheric t