VORTEX

Meteorological variables included in Vortex products

SERIES

VARIABLE	DESCRIPTION	UNITS
M(m/s)	wind speed	meters / second
D(deg)	wind direction	degrees
T(C)	air temperature	degrees Celsius
De(k/m3)	air density	kilograms / cubic meter
PRE(hPa)	atmospheric pressure	hecto-Pascal
RiNumber	Bulk Richardson Number: consumption of turbulence divided by the shear production of turbulence (the generation of turbulence kinetic energy caused by wind shear)	dimensionless
RH(%)	relative humidity: the ratio of how much water vapour is in the air to how much water vapour the air could potentially contain at a given temperature	percentage
RMOL(1/m)	The inverse of the Monin-Obukhov Length. It's used to characterize atmospheric stability. Stable conditions: RMOL > 0 Unstable conditions: RMOL <0 Neutral conditions: RMOL ≈ 0	1 / meters

LES

VARIABLE	DESCRIPTION	UNITS
M(m/s)	wind speed	meters / second
D(deg)	wind direction	degrees
SD(m/s)	wind speed standard deviation	meters / second
DSD(deg)	wind direction standard deviation	degrees
Gust3s(m/s)	3-second gust: maximum speed in a 10-minute interval obtained from the average speed in a 3-second interval.	meters / second
T(C)	air temperature	degrees Celsius
PRE(hPa)	atmospheric pressure	hecto-Pascal
RiNumber	Bulk Richardson Number: consumption of turbulence divided by the shear production of turbulence (the generation of turbulence kinetic energy caused by wind shear)	dimensionless
VertM(m/s)	Vertical wind speed: the component of wind velocity that is directed vertically, either upward or downward. Understanding vertical wind speed is crucial in studying atmospheric stability.	meters / second

TIMES

VARIABLE	DESCRIPTION	UNITS
M(m/s)	wind speed	meters / second
D(deg)	wind direction	degrees
SD(m/s)	wind speed standard deviation	meters / second
T(C)	air temperature	degrees Celsius
De(k/m3)	air density	kilograms / cubic meter
PRE(hPa)	atmospheric pressure	hecto-Pascal
RiNumber	Bulk Richardson Number: consumption of turbulence divided by the shear production of turbulence (the generation of turbulence kinetic energy caused by wind shear)	dimensionless
RH(%)	relative humidity: the ratio of how much water vapour is in the air to how much water vapour the air could potentially contain at a given temperature	percentage
RMOL(1/m)	The inverse of the Monin-Obukhov Length. It's used to characterize atmospheric stability. Stable conditions: RMOL > 0 Unstable conditions: RMOL < 0 Neutral conditions: RMOL ≈ 0	1 / meters
VertM(m/s)	Vertical wind speed: the component of wind velocity that is directed vertically, either upward or downward. Understanding vertical wind speed is crucial in studying atmospheric stability.	meters / second

FARM

VARIABLE	DESCRIPTION	UNITS
M(m/s)	wind speed	meters / second
T(C)	air temperature	degrees Celsius
TI (15 m/s)	Turbulence intensity at 15 m/s: how much the wind speed varies around the 15 m/s wind speed at a location. TI(%)= (SD/M)×100, where M=15 m/s	percentage
Mean TI	Weighted average turbulence intensity measures wind speed variation within specific speed ranges, emphasizing bins with higher wind speed occurrences.	percentage
Vref	Reference wind speed: extreme wind speed for a 50-year return period estimated using a Gumbel probability distribution fitted to wind speed data collected over a 30-year period.	meters / second

BLOCKS

VARIABLE	DESCRIPTION	UNITS
M(m/s)	wind speed	meters / second
D(deg)	wind direction	degrees
T(C)	air temperature	degrees Celsius
PRE(hPa)	atmospheric pressure	hecto-Pascal
RiNumber	Bulk Richardson Number: consumption of turbulence divided by the shear production of turbulence (the generation of turbulence kinetic energy caused by wind shear)	dimensionless
RMOL(1/m)	The inverse of the Monin-Obukhov Length. It's used to characterize atmospheric stability. Stable conditions: RMOL > 0 Unstable conditions: RMOL < 0 Neutral conditions: RMOL ≈ 0	1 / meters
TI (15 m/s)	Turbulence intensity at 15 m/s: how much the wind speed varies around the 15 m/s wind speed at a location. TI(%)= (SD/M)×100, where M=15 m/s	percentage
Mean TI	Weighted average turbulence intensity measures wind speed variation within specific speed ranges, emphasizing bins with higher wind speed occurrences.	percentage

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