Glossary of Atmospheric Terms

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A

Absolute humidity: It is the mass of water vapor in a given volume

Absolutely stable air: It is an atmospheric condition that exists when the environmental lapse rate is less than the moist adiabatic lapse rate.

Absolutely unstable air: It is an atmospheric condition that exists when the environmental lapse rate is greater than the dry adiabatic lapse rate.

Absorption: Absorption is the process in which incident radiant energy is retained by a substance by conversion to some other form of energy.

Absorptivity: It is the efficiency of radiation absorption.

Accretion: It is the growth of a precipitation particle by the collision of an ice crystal or snowflake with a super cooled liquid droplet that freezes upon impact.

Actual evapotranspiraton: It is the rate of water lost from vegetation and soil, ordinarily at a slower rate than the potential rate.

Adiabat: It is a line on a thermodynamic chart relating the pressure and temperature of a substance (such as air) that is undergoing a transformation in which no heat is exchanged with its environment.

Adiabatic process: It is a process that takes place without a transfer of heat between the system (such as an air parcel) and its surroundings. In an adiabatic process compression always results in warming, and expansion results in cooling

Adiabatic lapse rate: It is the rate of decreased temperature experienced by a parcel of air when it is lifted in the atmosphere under the restriction that it cannot exchange heat with its environment. For parcels that remain unsaturated during lifting, the (dry adiabatic) lapse rate is 9.8 degrees per kilometer.

Advection: It is the horizontal transfer of any atmospheric property by wind.

Aerovane: It is a device that resembles a wind vane with a propeller at one end. It is used to indicate wind speed and direction.

Aerosol: Aerosol is a system of colloidal particles dispersed in a gas, such as smoke or fog.

Air density: It is mass per unit volume of air; about 1.275 km per cubic meter at 0□C and 1000 millibars.

Air mass: Air mass is a body of air covering a relatively wide area and exhibiting horizontally uniform properties.

Air pressure: It is the cumulative force exerted on any surface by the molecules composing air.

Albedo: Albedo is the reflectivity; the percent of radiation returning from a surface compared to that which strikes it.

Altimeter: It is an instrument that indicates the altitude of an object above a fixed level. Pressure altimeters use an aneroid barometer with a scale graduated in altitude instead of pressure.

Altocumulus: It□s a cloud belonging to a class characterized by globular masses or rolls in layers or patches, the individual elements being larger and darker than those of cirrocumulus and smaller than those of stratocumulus. These clouds are of medium altitude, about 8000-20,000 ft (2400-6100 m). A middle cloud, usually white or gray, often occurs in layers or patches with wavy, rounded masses or rolls.

Altostratus: It□s a cloud belonging to a class characterized by a generally uniform gray sheet or layer, lighter in color than nimbostratus and darker than cirrostratus. These clouds are of medium altitude, about 8000 to 20,000 ft (2400-6100 m).

Ambient air: Ambient air is the air surrounding a cloud, or the air surrounding rising or sinking air parcels.

Anemometer: It is an instrument designed to measure wind speed.

Aneroid barometer: It is an instrument for measuring atmospheric pressure in which a needle, attached to the top of an evacuated box, is deflected as changes in atmospheric pressure causes the top of the box to bend in or out. It contains no liquid.

Anomalies: They are the departures of temperature, precipitation, or other weather elements from long-term averages.

Anticyclone: It is a large-scale circulation of winds around a central region of high atmospheric pressure, clockwise in the Northern Hemisphere, counterclockwise in the Southern Hemisphere.

Arctic air: Arctic air is a very cold and dry air mass that forms primarily in winter and the northern interior of North America.

Atmospheric pressure: It is the pressure exerted by the earth's atmosphere at any given point, determined by taking the product of the gravitational acceleration at the point and the mass of the unit area column of air above the point.

Atmospheric window: It is a region of the electromagnetic spectrum from 8 to 12 □m where the atmosphere is transparent to radiation.

Azimuth angle: 1. It is the direction or bearing toward which a sloping surface faces (e.g., a north-facing slope has an azimuth angle of 360□; a northeast-facing slope, an azimuth angle of 45□). 2. It is the arc of the horizon measured clockwise from north to the point where a vertical circle through a given heavenly body intersects the horizon (e.g., used for solar azimuth angle).

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B

Barometer: It is an instrument that measures atmospheric pressure. The two most common barometers are the mercury barometer and the aneroid barometer.

Barometric pressure: It is the pressure of the atmosphere as indicated by a barometer.

Beaufort scale: It is a scale of wind strength based on visual assessment of the effects of wind on seas and vegetation.

Black body: It is a hypothetical object that absorbs all of the radiation that strikes it. It also emits radiation at a maximum rate for its given temperature.

Blizzard: It is a severe weather condition characterized by low temperatures and strong winds (greater than 32 mi/hr) bearing a great amount of snow. When these conditions continue after the falling snow has ended, it is termed a ground blizzard.

Bowen ratio: A Bowen ratio is the ratio of energy available for sensible heating to energy available for latent heating.

Boyle's law: It is when the temperature is held constant, the pressure and density of an ideal gas are directly proportional.

Boundary layer: It is the layer of fluid in the immediate vicinity of a bounding surface; in the atmosphere, the air layer near the ground affected by diurnal heat, moisture or momentum transfer to or from the surface.

Brightness temperature: See IR brightness temperature.

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C

Capping inversion: It is an elevated inversion layer that caps a convective boundary layer, keeping the convective elements from rising higher into the atmosphere.

Ceilometer: It is a device using a laser or other light source to determine the height of a cloud base. An optical ceilometer uses triangulation to determine the height of a spot of light projected onto the base of the cloud; a laser ceilometer determines the height by measuring the time required for a pulse of light to be scattered back from the cloud base.

Centrifugal force: It is a force directed outward, away from the center of a rotating object; equal in

magnitude to the centripetal force but in the opposite direction.

Centripetal force: It is an inward-directed force that confines an object to a circular path; and is equal in magnitude to the centrifugal force but in the opposite direction.

Charles' law: It says with constant pressure, the temperature of an ideal gas is inversely proportional to the density of the gas.

Chinook: It is a warm, dry wind on the eastern side of the Rocky Mountains. In the Alps, the wind is called a Foehn.

Cirrocumulus: It is a cirriform cloud characterized by thin, white patches, each of which is composed of very small granules or ripples. These clouds are of high altitude (20,000-40,000 ft or 6000 -12,000 m).

Cirrostratus: It□s a cloud belonging to a class characterized by a composition of ice crystals and often by the production of halo phenomena. It appears as a whitish and usually somewhat fibrous veil, often covering the whole sky and sometimes so thin as to be hardly discernible. These clouds are of high altitude (20,000-40,000 ft or 6000 -12,000 m).

Cirrus: It is a cloud belonging to a class characterized by thin white filaments or narrow bands and a composition of ice crystals. These clouds are of high altitude (20,000-40,000 ft or 6000 -12,000 m).

Climate: It is the accumulation of daily and seasonal weather events over a long period of time. It is a description of aggregate weather conditions; the sum of all statistical weather information that helps describe a place or region.

Climatology: It is the science that deals with the phenomena of climates or climatic conditions.

Cloud base: It is the lowest portion of a cloud.

Cloud condensation nucleus: It is a particle, either liquid or solid, upon which water condenses to form cloud droplets.

Cloud cover: It is the amount of the sky obscured by clouds when observed at a particular location.

Cloud deck: It is the top of a cloud layer, usually viewed from an aircraft.

Coalescence: It is the merging of cloud droplets into a single larger droplet.

Cold front: It is a zone separating two air masses, of which the cooler, denser mass is advancing and replacing the warmer.

Collection efficiency: It is the fraction of droplets approaching a surface that actually deposit on that surface.

Condensation: It is the process by which water changes phase from a vapor to a liquid.

Conditionally unstable air: It is an atmospheric condition that exists when the environmental lapse rate is less than the dry adiabatic lapse rate but greater than the moist adiabatic lapse rate.

Conduction: It is the transfer of heat by molecular activity from one substance to another, or through a substance. Transfer is always from warmer to colder regions.

Contrail (condensation trail): It is cloudlike streamer frequently seen forming behind aircraft flying in clear, cold, humid air.

Convection: 1. It is a vertical air circulation in which warm air rises and cool air sinks, resulting in vertical transport and mixing of atmospheric properties. 2. It is a flow of heat by this circulation.

Convective condensation level (CCL): It is the level above the surface marking the base of a cumiliform cloud that is forming due to surface heating and rising thermals.

Convergence: It is an atmospheric condition that exists when the winds cause a horizontal net inflow of air into a specified region.

Coriolis force: It is a fictitious force used to account for the apparent deflection of a body in motion with respect to the earth, as seen by an observer on the earth. The deflection (to the right in the Northern Hemisphere) is caused by the rotation of the earth.

Cumuliform: It is having the appearance or character of cumulus clouds.

Cumulonimbus: It□s a cloud belonging to a class indicative of thunderstorm conditions characterized by large, dense towers that often reach altitudes of 30,000 ft (9000 m) or more, cumuliform except for their tops, which appear fibrous because of the presence of ice crystals. The cloud is frequently accompanied by heavy showers, lightning, thunder, and sometimes hail. It is also known as a thunderstorm cloud.

Cumulus: It□s a cloud belonging to a class characterized by dense individual elements in the form of puffs, mounds or towers, with flat bases and tops that often resemble cauliflower. They are found at a lower altitude than altocumulus, usually below 8000 ft (2400 m).

Cup anemometer: It is an instrument used to monitor wind-speed. Wind rotation of cups generates and electric current calibrated in wind speed.

Cyclone: A cyclone is a large-scale circulation of winds around a central region of low atmospheric pressure, counterclockwise in the Northern Hemisphere, clockwise in the Southern Hemisphere.

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D

Density: It is the ratio of the mass of a substance to the volume occupied by it.

Deposition: It is a process that occurs in subfreezing air when water vapor changes directly to ice without becoming a liquid first. (Also called sublimation in meteorology.)

Dew-point (dew point temperature): It is the temperature to which air must be cooled (at constant

pressure and constant water vapor content) for saturation to occur. When the dew point falls below freezing it is called the frost point.

Diffuse insolation: It is the solar radiation that is scattered or reflected by atmospheric components (clouds, for example) to the earth's surface.

Direct insolation: It is the solar radiation that is transmitted directly through the atmosphere to the earth's surface without interacting with atmospheric components.

Diurnal: Diurnal means daily, especially pertaining to actions which are completed in 24 hours and are repeated every 24 hours.

Divergence: It is an atmospheric condition that exists when the winds cause a horizontal net outflow of air from a specific region.

Doppler velocity [m/s]: When using doppler velocity, the positive is down (towards the radar). Particle and air motions contribute to the velocity.

Downdraft: It□s downward moving air, usually within a thunderstorm cell.

Drizzle: It is small drops between 0.2 and 0.5 mm in diameter that fall slowly and reduce visibility more than light rain.

Dry adiabatic lapse rate: It is the rate at which the temperature of a parcel of dry air decreases as the parcel is lifted in the atmosphere. The dry adiabatic lapse rate (abbreviated DALR) is 5.5□F per 1000 ft or 9.8□C per km.

Dry line: The dry line is roughly north-south boundary between moist air in the Mississippi Valley and dry air on the west side of the Great Plains descending from the Mexican Plateau and Southern Rockies. Thunderstorms often form along this line, which moves eastward during the morning and westward in the evening.

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E

Eddy: Eddy is swirling currents of air at variance with the main current.

Effective emissivity: It is a correction factor, dependent on the radiational characteristics of the earth-atmosphere system, that permits application of black body radiation laws to the earth-atmosphere system.

El Ni□o: It means literally, the Christ child, a name given to an extensive ocean warming in the equatorial eastern Pacific along the coast of Peru and Ecuador that often begins around Christmas (hence, the name). The warming brings nutrient-poor tropical water southward along the west coast of South America in major events that recur at intervals of 3-7 years. El Ni□o is associated with atmospheric circulations that produce wide ranging effects on global weather and climate.

Emissivity: It is the fractional amount of radiation emitted by a given object or substance in comparison to the amount emitted by a perfect emitter.

Emittance: It is the rate at which a black body radiates energy across all wavelengths.

Entrainment: It is the mixing of environmental air into a preexisting air current or cloud so that the environmental air becomes part of the current or cloud.

Environmental lapse rate: It is the rate of decrease of air temperature with height, usually measured with a radiosonde.

Equilibrium vapor pressure: It is the necessary vapor pressure around liquid water that allows the water to remain in equilibrium with its environment. It is also called saturation vapor pressure.

Evaporation: Evaporation is the process by which a liquid changes into a gas.

Evapotranspiration: It is the vaporization of water through direct evaporation from wet surfaces and the release of water vapor by vegetation.

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F

Fall streaks: It is the falling ice crystals that evaporate before reaching the ground.

Flux: Flux is the rate of transfer of fluids, particles or energy per unit area across a given surface.

Fog: Fog is a cloud with its base at the earth's surface. It reduces visibility to below 1 km.

Free atmosphere: It is the part of the atmosphere that lies above the frictional influence of the earth's surface.

Freezing level: It is the altitude at which the air temperature first drops below freezing.

Front (or frontal zone): It is an interface or zone of transition between two distinct air masses.

Frontal inversion: It is a temperature inversion that develops aloft when warm air overruns the cold air behind a front.

Frost (also called hoarfrost): Frost is a covering of ice produced by deposition (sublimation) on exposed surfaces when the air temperature falls below the frost point (the dew point is below freezing).

Frost point: See Dew point

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G

Geostrophic wind: It is a theoretical horizontal wind blowing in a straight path, parallel to the isobars or contours, at a constant speed. The geostrophic wind results when the Coriolis force exactly balances the horizontal pressure gradient force.

GMT: This means Greenwich Mean Time, same as UTC.

GPS: It means Global Positioning System, a navigation system which uses a constellation of artificial earth satellites to make precise determinations of the latitude and longitude of locations on the earth's surface or in the atmosphere.

Gradient: It is a rate of change with respect to distance of a variable quantity, as temperature or pressure, in the direction of maximum change.

Graupel: It is the same as snow pellets or small hail.

Greenhouse effect: It is atmospheric heating caused by solar radiation being readily transmitted inward through the earth's atmosphere but longwave radiation less readily transmitted outward, due to absorption by certain gases in the atmosphere.

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H

Hail: Hail is solid precipitation in the form of chunks or balls of ice with diameters greater than 5 mm. The stones fall from cumulonimbus clouds.

Hailstones: They are transparent or partially opaque particles of ice that range in size from that of a pea to that of golf balls.

Halo: Halos are rings or arcs that encircle the sun or moon when seen through an ice crystal cloud or a sky filled with falling ice crystals. Halos are produced by reflection of light by ice crystals suspended in the earth's atmosphere and exhibiting prismatic coloration ranging from red inside to blue outside.

Haze: It is the fine dry or wet dust or salt particles dispersed through a portion of the atmosphere. Individually these are not visible but cumulatively they will diminish visibility.

Heat: Heat is a form of energy transferred between systems by virtue of their temperature differences.

Heat capacity: It is the ratio of the heat absorbed (or released) by a system to the corresponding temperature rise (or fall).

Heat index (HI): It is an index that combines air temperature and relative humidity to determine an apparent temperature-how hot it actually feels.

Hertz: It is an international unit of frequency equal to one cycle per second, and named after a German physicist.

Hurricane: It is a severe tropical cyclone having winds in excess of 64 knots (74 mi/hr).

Hygrometer: It is an instrument designed to measure the air's water vapor content. The sensing part of the instrument can be hair (hair hygrometer), a plate coated with carbon (electrical hygrometer), or an infrared sensor (infrared hygrometer).

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I

Ice crystal: It is precipitation consisting of small, slowly falling crystals of ice.

Ice nuclei: They are particles that act as nuclei for the formation of ice crystals in the atmosphere.

Ideal gas laws: They are the thermodynamic laws applying to perfect gases.

Infrared radiation: It is the electromagnetic radiation with wavelengths between about 0.7 and 1000 □m. This radiation is longer than visible radiation but shorter than microwave radiation.

Insolation: It is the incoming solar radiation that reaches the earth and the atmosphere.

Inversion: It is an increase in air temperature with height.

IR brightness temperature [□C]: It is the down welling atmospheric emission in the 9.9-11.4 □m band; in general, relatively warmer temperatures imply "thicker" clouds.

Isobar: It is a line of equal or constant pressure; an isopleth of pressure.

Isotach: It is a line on a weather map or chart connecting points where winds of equal speeds have been recorded.

Isotherm: It is a line of equal or constant temperature, an isopleth of temperature.

Isothermal: It is the temperature remaining constant with height or time.

Isotropic: It is a line of constant equal physical properties along all axes.

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J

Jet: c a fast-moving wind current surrounded by slower moving air.

Jet stream: It is generally strong westerly winds concentrated in a narrow and shallow stream in the upper troposphere.

Jet stream cirrus: It is a loose term for filamentous cirrus that appears to radiate from a point in the sky, and exhibits characteristics associated with strong vertical wind shear, such as twisted or curved filaments.

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K

Kelvin-Helmholtz waves: (Stull's definition) It is vertical waves in the air associated with wind shear across statically-stable regions. Can appear as breaking waves and as braided patterns in radar images and cloud photos.

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L

Lapse rate: It is the rate at which an atmospheric variable (usually temperature) decreases with elevation.

Latent heat: It is the heat that is either released or absorbed by a unit mass of a substance when it undergoes a change of state, such as during evaporation, condensation, or sublimation.

Latent heat flux: It is the flux of heat from the earth's surface to the atmosphere that is associated with evaporation or condensation of water vapor at the surface; a component of the surface energy budget.

LDT: This means Local Daylight Time.

Lightning: Lightning is a visible electrical discharge produced by a thunderstorm. The discharge may occur within or between clouds, between the cloud and air, between a cloud and the ground or between the ground and a cloud.

LOS: LOS stands for line-of-sight. For our work this usually refers to contributions of radiation from the atmosphere along the line-of-sight (path) that an instrument recieves.

Liquid water path [gm/m^2]: It is a measure of the total amount of liquid water present in the column. A retrieved quantity from the microwave radiometer.

Longwave radiation: It is a term used to describe the infrared energy emitted by the earth and atmosphere at wavelengths between about 5 and 25 micrometers. Compare this to shortwave radiation.

Low-level jet: It is a regular, strong, nighttime, northward flow of maritime tropical air over the sloping Great Plains of the central United States. The wind increases to a peak in the lowest kilometer and then decreases above.

LST: This means Local Standard Time.

LWP: See Liquid water path .

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M

Macroscale: This pertains to meteorological phenomena, such as wind circulations or cloud patterns, that are greater than 200 km in horizontal extent.

Melting layer: The layer below the 0□C isotherm where snowflakes melt and turn into raindrops. When viewed by radar this layer appears as a band of enhanced reflectivity; thus it is commonly known as the 'radar bright band'. The microphysics of the melting layer of precipitation is an important feature for Stratiform precipitation. The melting layer's degrading effect on satellite communication links makes understanding it important as well.

Mercury barometer: It is an instrument for measuring atmospheric pressure. The instrument contains an evacuated and graduated glass tube in which mercury rises or falls as the pressure of the atmosphere increases or decreases.

Mesoscale: This is a scale of meteorological phenomena that ranges in size from a few km to about 100 km. It includes local winds, thunderstorms, and tornadoes.

Meteorology: It is the study of the atmosphere and atmospheric phenomena as well as the atmosphere's interaction with the earth's surface, oceans, and life in general. A distinction can be drawn between meteorology and climatology, the latter being primarily concerned with average, not actual, weather conditions.

Microburst: It is an intense, localized downdraft of air that spreads on the ground, causing rapid changes in wind direction and speed; a localized downburst.

Microscale: It pertains to meteorological phenomena, such as wind circulations or cloud patterns, that are less than 2 km in horizontal extent.

Millibar: It is a unit of atmospheric pressure equal to 1/1000 bar, or 1000 dynes per square centimeter. Sea level pressure is normally close to 1013 mb.

Mixed layer: It is an atmospheric layer, usually the layer immediately above the ground, in which pollutants are well mixed by convective or shear-produced turbulence.

Mixing ratio: It is the ratio of the mass of water vapor in a given volume of air to the mass of dry air.

Moist adiabatic lapse rate: It is the rate at which the temperature of a parcel of saturated air decreases as the parcel is lifted in the atmosphere. The moist adiabatic lapse rate (abbreviated MALR) is not a constant like the dry adiabatic lapse rate but is dependent on parcel temperature and pressure.

MSL: This means it is above mean sea level.

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N

Neutral stability (neutrally stable air): It is an atmospheric condition that exists in unsaturated (saturated) air when the environmental lapse rate equals the dry (moist) adiabatic rate.

Nimbostratus: It is a cloud of the class characterized by a formless layer that is almost uniformly dark gray; a rain cloud of the layer type, of low altitude, usually below 8000 ft (2400 m).

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O

Occluded front: It is a composite of two fronts, formed as a cold front overtakes a warm or quasi-stationary front. Two types of occlusions can form depending on the relative coldness of the air behind the cold front to the air ahead of the warm or stationary front. A cold occlusion results when the coldest air is behind the cold front and a warm occlusion results when the coldest air is ahead of the warm front.

Ozone: It is a form of oxygen, O3. It□s a powerful oxidizing agent that is considered a pollutant in the lower troposphere but an essential chemical in the stratosphere where it protects the earth from high-energy ultraviolet radiation from the sun.

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P

Pilot balloon (pibal): It is a small helium-filled meteorological balloon that is tracked as it rises through the atmosphere to determine how wind speed and direction change with altitude.

Potential energy: It is the energy that a body possesses by virtue of its position with respect to other bodies in the field of gravity.

Potential temperature: It is the temperature that a parcel of dry air would have if it were brought dry adiabatic ally from its original position to a pressure of 1000 mb.

Precipitable water: It is the depth of water that would result if all the vapor in the atmosphere above a location were condensed into liquid water.

Precipitation: Precipitation is any form of water particles-liquid or solid-that falls from the atmosphere and reaches the ground.

Pressure: Pressure is the exertion of force upon a surface by a fluid (e.g., the atmosphere) in contact with it.

Prevailing wind: It is the wind direction most frequently observed during a given period.

Psychrometer: This is an instrument used to measure the water vapor content of the air. It consists of two thermometers (dry bulb and wet bulb). After whirling the instrument, the dew point and relative humidity can be obtained with the aid of tables.

Pyranometer: It is an instrument that measures the amount of radiation.

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Q

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R

Radar: Radar is an instrument useful for remote sensing of meteorological phenomena. It operates by sending radio waves and monitoring those returned by such reflecting objects as raindrops within clouds.

Radiation: It is energy transported through electromagnetic waves. These waves do not need molecules to propagate them, and in a vacuum they travel at nearly 300,000 km per sec. See shortwave radiation and longwave radiation

Radiosonde: It is an instrument that is carried aloft by a balloon to send back information on atmospheric temperature, pressure and humidity by means of a small, expendable radio transmitter. Radiosondes can be tracked by radar, radio direction finding, or navigation systems (such as the satellite Global Positioning System) to obtain wind data. See also rawinsonde

Rain: Rain is precipitation that falls to earth in drops more than 0.5 mm in diameter.

Rain gage: This is a device-usually a cylindrical container-for measuring rain-fall.

Rawinsonde: It is a radiosonde that is tracked to measure winds. See Radiosonde

Reflection: It is the process whereby a surface turns back a portion of the radiation that strikes it.

Reflectivity [dBZ]: This is a measure of the returned power, which is sensitive to the size and number of hydrometeors (i.e. the particle size spectra).

Refraction: It is the bending of light as it passes from one medium to another

Relative humidity: It is the ratio of the amount of water vapor actually in the air compared to the amount of water vapor the air can hold at the particular temperature and pressure. The ratio of the air's actual vapor pressure to its saturation vapor pressure.

Residual layer: It is the elevated portion of a convective boundary layer that remains after a stable boundary layer develops at the ground (usually in late afternoon or early evening) and cuts off convection.

Resonance: It□s the state of a system in which an abnormally large vibration is produced in response to an external stimulus, occurring when the frequency of the stimulus is the same, or nearly the same, as the natural vibration frequency of the system.

Ridge: On a weather chart, it□s a narrow elongated area of relatively high pressure.

Rossby waves: These are a series of troughs and ridges on quasi-horizontal surfaces in the major belt of upper tropospheric westerlies. The waves are thousands of kilometers long and have significant latitudinal amplitude.

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S

Sampling frequency: It is the rate at which sensor data is read or sampled.

Saturation vapor pressure: It□s the maximum amount of water vapor necessary to keep moist air in equilibrium with a surface of pure water or ice. It represents the maximum amount of water vapor that the air can hold at any given temperature and pressure. (See Equilibrium vapor pressure)

Scattering: Scattering is the process in which a beam of light is diffused or deflected by collisions with particles suspended in the atmosphere.

Sea level pressure: It is the atmospheric pressure at mean sea level.

Sensible heat flux: It is the flux of heat from the earth's surface to the atmosphere that is not associated with phase changes of water. It is

Severe thunderstorm: It is a thunderstorm that produces heavy precipitation, frequent lightning, strong, gusty surface winds or hail. A severe thunderstorm can cause flash flooding and wind and hail damage and may spawn tornadoes.

SGP: The Southern Great Plains site covers Oklahoma and part of Kansas.

Shortwave radiation: It is a term used to describe the radiant energy emitted by the sun in the visible and near-ultraviolet wavelengths (between about 0.1 and 2 micrometers). Compare this to longwave radiation.

Short wave trough: This is a relatively small-scale trough that is superimposed on and propagates through the longer wavelength Rossby waves.

Sling psychrometer: It is an instrument used to measure the water vapor content of the atmosphere, which wet and dry bulb thermometers are mounted on a frame connected to a handle at one end by means of a bearing or a length of chain. The psychrometer is whirled by hand to provide the necessary ventilation to evaporate water from the wet bulb.

Snow: Snow is precipitation in the form of ice crystals, mainly of intricately branched, hexagonal form and often agglomerated into snowflakes, formed directly from the freezing [deposition] of the water vapor in the air.

Snowflake: A snowflake is an aggregate of ice crystals that falls from a cloud.

Sounding: It is a set of data measuring the vertical structure of an atmospheric parameter (temperature, humidity, pressure, winds, etc.) at a given time.

Specific heat: It is the ratio of the heat absorbed (or released) by the unit mass of the system to the corresponding temperature rise (or fall).

Specific humidity: It is the ratio of the mass of water vapor in a given parcel to the total mass of air in the parcel.

Spectral width [m/s]: It is a measure of the spread of the Doppler spectrum and consequently is sensitive to the spread in the particle size spectra. A larger spectral width is indicative of the presence of a broader range of sizes of hydrometeors.

Squall line: A squall line is any nonfrontal line or band of active thunderstorms.

Station pressure: It is the actual air pressure measured at the observing station.

Stability: It is the degree of resistance of a layer of air to vertical motion.

Stable air: see absolutely stable air

Standard atmosphere: It is a hypothetical vertical distribution of temperature, pressure and density which, by international consent, is taken to be representative of the atmosphere for purposes of pressure altimeter calibrations, aircraft performance calculations, aircraft and missile design, ballistic tables, etc.

Stationary front: It is a front between warm and cold air masses that is moving very slowly or not at all.

Stratiform: A stratiform is (a cloud) having predominantly horizontal development.

Stratocumulus: It is a cloud belonging to a class characterized by large dark, rounded masses, usually in groups, lines, or waves, the individual elements being larger than those in altocumulus and the whole being at a lower altitude, usually below 8000 ft (2400 m).

Stratosphere: It is the layer of the atmosphere above the troposphere and below the mesosphere (between 10 km and 50 km), generally characterized by an increase in temperature with height.

Stratus: It is a cloud belonging to a class characterized by a gray, horizontal layer with a uniform base, found at a lower altitude than altostratus, usually below 8000 ft (2400 m).

Sublimation: It is the process whereby ice changes directly into water vapor without melting. In meteorology, sublimation can also mean the transformation of water vapor into ice. (See Deposition.)

Subsidence: It is the slow sinking of air, usually associated wit high-pressure areas.

Sundog: A sundog is a colored luminous spot produced by refraction of light through ice crystals that appears on either side of the sun. Also called parhelion

Sun pillar: It is a vertical streak of light extending above (or below) the sun. It is produced by the reflection of sunlight of ice crystals.

Supercool: It means to cool a liquid below its freezing point without solidification or crystallization.

Supersaturated air: It is a condition that occurs in the atmosphere when the relative humidity is greater that 100 percent.

Surface energy budget: It is the energy or heat budget at the earth's surface, considered in terms of the fluxes through a plane at the earth-atmosphere interface. The energy budget includes radiative, sensible, latent and ground heat fluxes.

Surface weather chart: It is an analyzed synoptic chart of surface weather observations. A surface chart shows the distribution of sea-level pressure (therefore, the position of highs, lows, ridges and troughs) and the location and nature of fronts and air masses. Often added to this are symbols for occurring weather phenomena. Although the pressure is referred to mean sea level, all other elements on this chart are presented as they occur at the surface point of observation.

Synoptic scale: This is the typical weather map scale that shows features such as high- and low-pressure areas and fronts over a distance spanning a continent. Also called the cyclonic scale. Typically ranging on the scale of 1000 to 2500km.

[A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z]

T

Temperature: It is the degree of hotness or coldness of a substance as measured by a thermometer. It is also a measure of the average speed or kinetic energy of the atoms and molecules in a substance.

Temperature inversion: It is an extremely stable air layer in which temperature increases with altitude, the inverse of the usual temperature profile in the troposphere.

Terminal velocity: It is the constant speed obtained by a falling object when the upward drag on the object balances the downward force of gravity.

Thermal: It is a small, rising parcel of warm air produced when the earth's surface is heated unevenly.

Thermally driven circulation: It is a diurnally reversing closed cellular wind current resulting from horizontal temperature contrasts caused by different rates of heating or cooling over adjacent surfaces; includes along-slope, cross-valley, along-valley, mountain-plain and sea breeze circulations.

Thermistor: It is a resistor whose resistance changes with temperature. Because of the known dependence of resistance on temperature, the resistor can be used as a temperature sensor.

Thermograph: It is a recording instrument that gives a continuous trace of temperature with time.

Thermometer: It is an instrument used to measure temperature.

Thunder: It is the sound caused by rapidly expanding gases in a lightning discharge.

Thunderstorm: It is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder.

Tornado: It is an intense, rotating column of air that protrudes from a cumulonimbus cloud in the shape of a funnel or a rope and touches the ground.

Transpiration: It is the passage of water vapor into the atmosphere through the vascular system of plants.

Tropopause: It is the boundary between the troposphere and stratosphere, characterized by an abrupt change in temperature lapse rate (temperatures decrease with height in the troposphere, but it increases or remains constant with height in the stratosphere).

Troposphere: It is the portion of the earth's atmosphere from the surface to the tropopause; that is, the lowest 10-20 km of the atmosphere. The troposphere is characterized by decreasing temperature with height, and is the layer of the atmosphere containing the most clouds and other common weather phenomena.

Trough: A trough is on a weather chart, a narrow, elongated area of relatively low pressure.

Turbulence: It is an irregular motion of the atmosphere, as indicated by gusts and lulls in the wind.

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U

Ultraviolet radiation: It is an electromagnetic radiation with wave-lengths longer than X-rays but shorter than visible light.

Unstable air: see absolutely unstable air

Upper-air weather chart: They are weather maps that are produced for the portion of the atmosphere above the lower troposphere, generally at and above 850 mb. Isolines on these maps usually represent the heights of a constant pressure surface, such as the 500 mb surface.

UTC: This means Coordinated Universal Time; the international time standard kept at Greenwich, England.

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V

Vapor pressure: It is the pressure exerted by the water vapor molecules in a given volume of air.

Virga: It is precipitation that falls from a cloud but evaporates before reaching the ground. (See Fall streaks)

Virtual temperature: It is an adjustment applied to the real air temperature to account for a reduction in air density due to the presence of water vapor.

Visibility: It is the distance at which a given standard object can be seen and identified with the unaided eye.

Visible light: It is the portion of the electromagnetic spectrum to which the eye is sensitive, i.e., light with wavelengths between 0.4 and 0.7 micrometers. Compare this to the shortwave radiation and longwave radiation.

Vortex: A vortex is a whirling mass of air in the form of a column or spiral. It need not be oriented vertically but, for example, could be rotating around a horizontal axis.

Vorticity: It is a measure of the spin of a fluid, usually small air parcels. Absolute vorticity is the combined vorticity due to the earth's rotation and the vorticity due to the air's circulation relative to the earth. Relative vorticity is due to the curving of the air flow and wind shear.

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W

Wake: A wake is the region of turbulence immediately to the rear of a solid body caused by the flow of air over or around the body.

Warm front: It is a transition zone between a mass of warm air and the colder air it is replacing.

Water vapor path [cm]: It is a measure of the total amount of water vapor present in the column. A retrieved quantity from the microwave radiometer.

Weather: It is the state of the atmosphere with respect to wind, temperature, cloudiness, moisture, pressure, etc.

Westerlies: It is the prevailing winds that blow from the west in the mid-latitudes.

Wet-bulb depression: It is the difference in degrees between the air temperature (dry-bulb temperature) and the wet-bulb temperature.

Wet-bulb temperature: It is the lowest temperature that can be obtained by evaporating water into the air.

Wind chill: see wind chill equivalent temperature.

Wind chill equivalent temperature: It is the apparent temperature felt on the exposed human body owing to the combination of temperature and wind speed.

Wind-chill factor: This factor is the cooling effect of any combination of temperature and wind, expressed as the loss of body heat. It is also called a wind-chill index.

Wind field: It is the three-dimensional spatial pattern of winds.

Wind shear: It is a difference in wind speed or direction between two wind currents in the atmosphere.

Wind Vane: It is an instrument used to determine wind direction.

Windsock: It is a large, conical, open bag designed to indicate wind direction and relative speed; usually used at small airports.

Winter solstice: It is approximately December 22 in the Northern Hemisphere when the sun is lowest in the sky and directly overhead at latitude 23.5□S, the Tropic of Capricorn.

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X

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Y

[A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z]

Z

Z: This means Zulu time, which is the same as UTC. (Coordinated Universal Time)

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