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# Atmospheric Environment Impact Assessment



# Definition

- **air pollution:** one kind of **phenomenon:** with the introduction of **any substance** to the atmosphere **resulted in** the **changing** of atmosphere in **chemical, physical, biological or radioactive characters**, thus affecting the effective use of atmosphere, and endanger human body health or damage to the ecosystem.

# source of atmospheric pollution

- point source (machine or exhaust funnel)
- scattering surface source ([escorial](#) )
- line source ([motor vehicle](#) on road)
- volume source (femerell)

# The data we needed

## ■ Local environment data

**predominant wind direction**

**wind speed, (m/s)**

**total cloud amount, (%)**

**low cloud amount, (%)**

**surface air temperature, (°C)**

**air – pressure, (KPa)**

**solar altitudinal angle, (deg)**

**solar dip angle, (deg)**

**longitude, (deg)**

**latitude, (deg)**

**atmospheric stability, (A/B/C/D/E/F)**

**height of atmospheric mixed layer, (m)**

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## ■ Pollutant source data

**pollutant name**

**pollutant concentration, (mg/m<sup>3</sup>)**

**emission rate, (m<sup>3</sup>/s)**

**height of exhaust tube, (m)**

**diameter of exhaust tube, (m)**

**smoke temperature, (K)**

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# Classification of atmospheric pollutants

- According to the existing form: particles pollutants and gaseous contaminants;
- Particle size less than  $15 \mu\text{m}$  pollutants can be defined as gaseous contaminants.
- Exhaust tube: various types of devices through which the organization form of the atmospheric pollutants discharged

## ▪ **Objects**

Civil pollution

Industry pollution

SO<sub>2</sub>, NO<sub>x</sub>, NO<sub>2</sub>, CO, O<sub>3</sub>, TSP, PM<sub>10</sub>, Pb, F, Odor, ...

# Air environmental quality --- 2 level

I level: national environmental protection  
district, special area;

II level: populated area, the commercial,  
traffic and residents mixed area; cultural area,  
industrial zone, rural area .

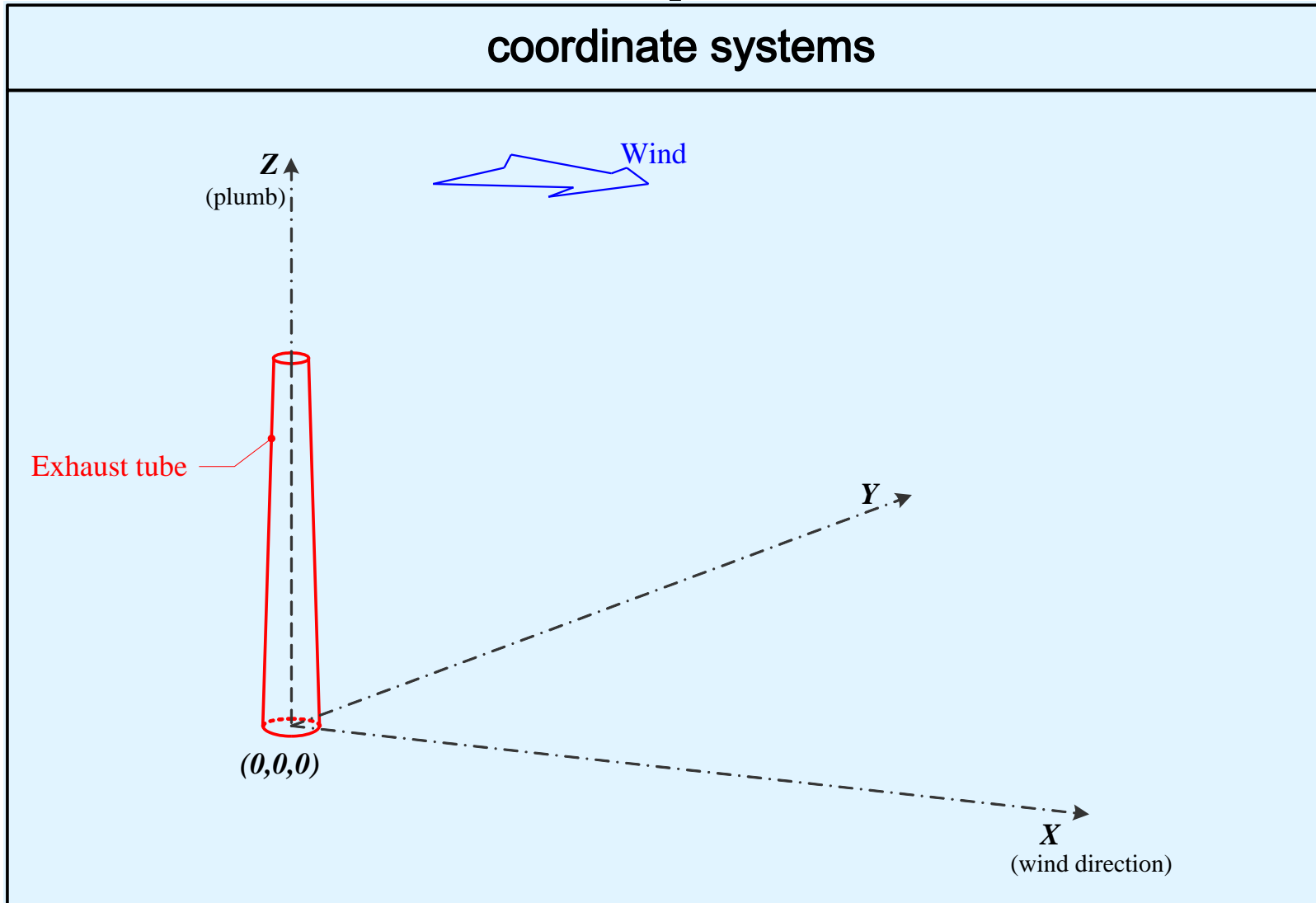
# Integrated emission standard of air pollutants ( GB 16297-1996)

- Emissions limit of 33 kinds of air pollutant:
- Emission concentration limit of exhaust gas through exhaust tube;
- Discharge rate limit of exhaust gas through exhaust tube;
- Beyond any standard means enterprises discharge pollutant without permission or beyond pollution limits.



# Smoke Emission Model

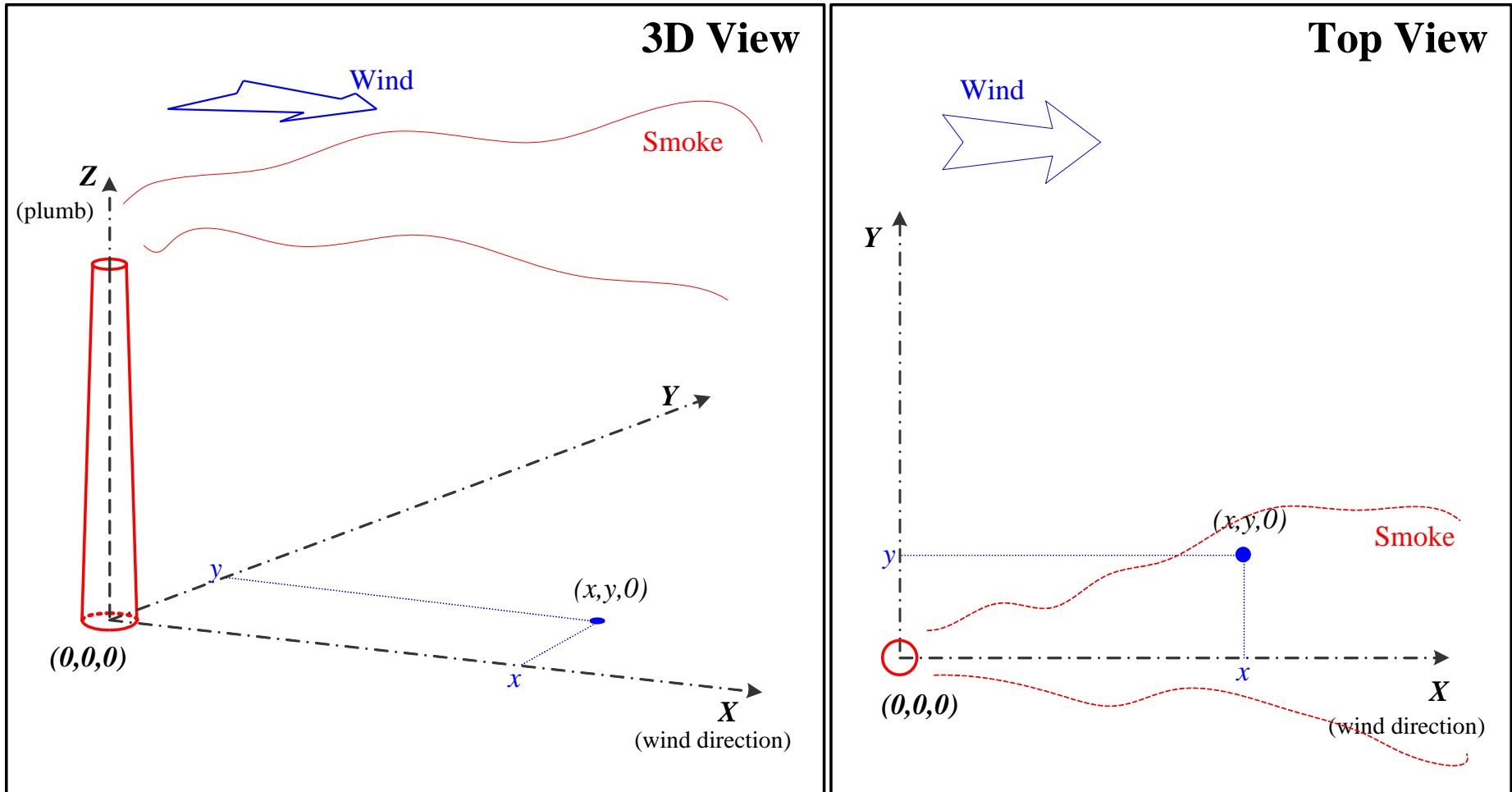
- Establish coordinate system



# Smoke Emission Model

normal windiness smoke-plume emission model ( $U_{10} \geq 1.5 \text{m/s}$ )

Along the wind, any point on the ground



# Air Pollution Prediction

## U.S

CALPUFF model  
AERMOD model  
AERMET model

<http://www.epa.gov/>

## U.K

ADMS --- a 3D gauss model

<http://www.cerc.co.uk/software/index.htm>