

# Surprising technique GPS Meteorology!!

—Now-cast torrential rain clouds

What is  
Humanosphere?

Noooo!  
A torrential rainfall!  
Was it just cloudy expected today?!

Whoosh!

A serious problem

This is going to cause serious problems!

huh!? ... and it's gone!

Can't this random weather be predicted...?

Thud

Poke

You wanna know if it's predictable or not, huh?

Oh, hello Ms. senior!

Shocked!

Actually torrential rainfall is caused by large cumulonimbus clouds that form within minutes, which is difficult to find using current observations that only detect rain drops

Mechanism of torrential rainfall

Expands rapidly from an "egg of a cloud" to a cumulonimbus cloud, causing sudden rainfall.

What!?

That's all current technologies can do!?

Therefore ...

Have you heard of "GPS meteorology"?

Of course!

It's in my phone!

No, I'm talking about meteorology.

GPS, used for many services, is a global positioning system which uses approximately 30 satellites that orbit the Earth.

Car navigation system

GEONET

GPS "tsunami" monitor

A groundbreaking method of meteorology based on GPS is currently being developed.

That's "GPS meteorology"!

GPS=Global Positioning System

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So using GPS for weather...??

Let me explain

umm...

The radio waves sent from the GPS satellite delays when passing through an "egg of a cloud". We can analyze these delays and predict "precipitable water vapor"\* in real-time.

Huh! So we can detect rainclouds before they form!

Weather sensor

GPS receiver

GPS satellites

egg of a cloud

Antenna

Using this system, dangers of torrential rainfall can be quickly communicated to people.

Warning to people

Incredible!

wow

Antennas set up in approximately 2km intervals

Data collection server

Local governments, firefighters, etc.

If we utilize the Japanese GPS satellites that will start operation, we can expect improved accuracy and ...

If GPS receivers are set together with current cellphone antennas, we won't need extra infrastructures. Quite realistic isn't it?

Ahhh!! Please, shall we use the umbrella?

Oh this? It was broken a moment ago...

WHAAT!?

Let's start setting it up right away!

We're currently running tests in Indonesia... hum?

Rain?

whoosh

\* Precipitable water vapor : Total amount of water vapor in the column atmosphere measured as water depth if all fall as rain.