JMA Nowcast Earthquake Information

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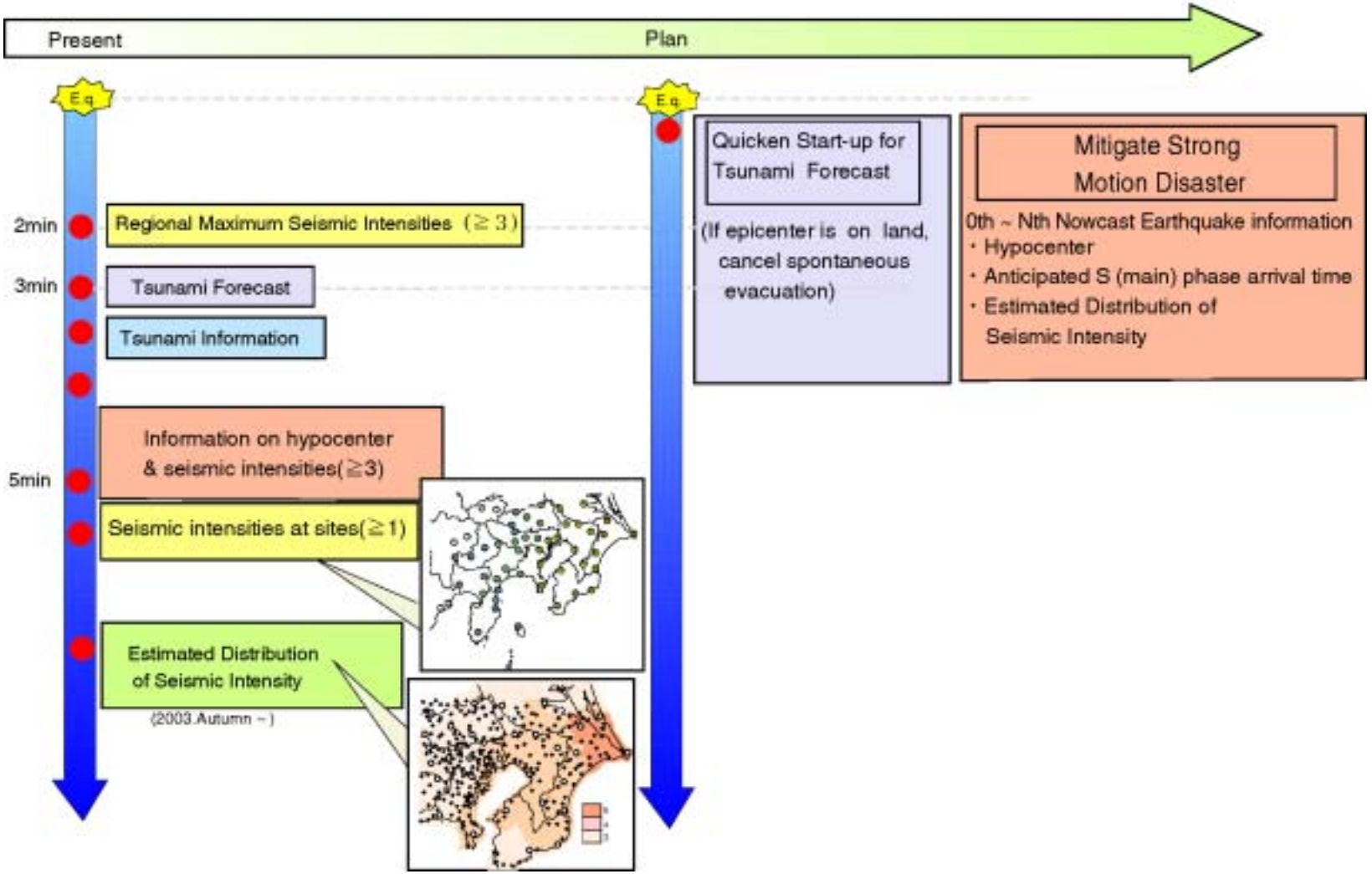
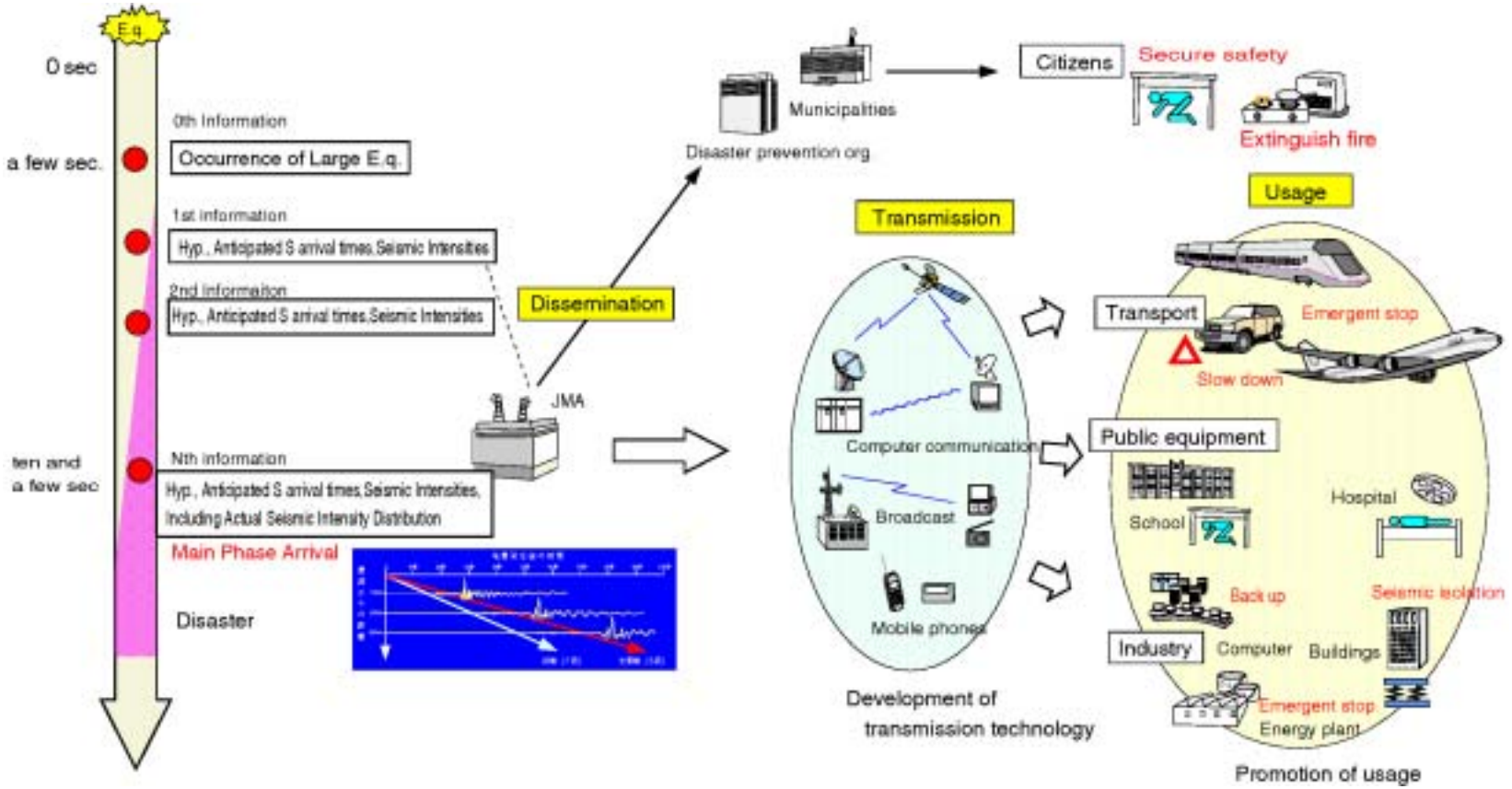
Japan Meteorological Agency

JMA Earthquake Information




E.q.
0 sec
a few sec.
ten and
a few sec
0th Information
Occurrence of Large E.q.
1st information
Hyp., Anticipated S arrival times,Seismic Intensities
2nd Information
Hyp., Anticipated S arrival times,Seismic Intensities
Nth information
Hyp., Anticipated S arrival times,Seismic Intensities,
Including Actual Seismic Intensity Distribution
Main Phase Arrival
Disaster
JMA
Dissemination
Disaster prevention org
Municipalities
Citizens
Secure safety
Extinguish fire
Transmission
Usage
Computer communication
Broadcast
Mobile phones
Development of
transmission technology
Transport
Emergent stop
Slow down
Public equipment
School
Hospital
Back up
Seismic isolation
Industry
Computer
Buildings
Emergent stop
Energy plant
Promotion of usage

Quick Estimation of

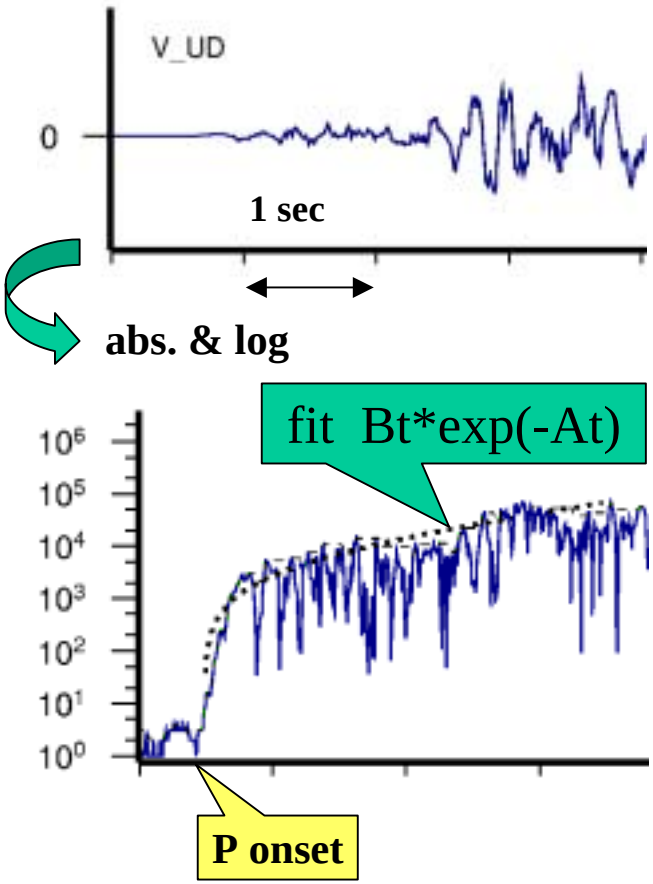
I Hypocenter
(single station / network)

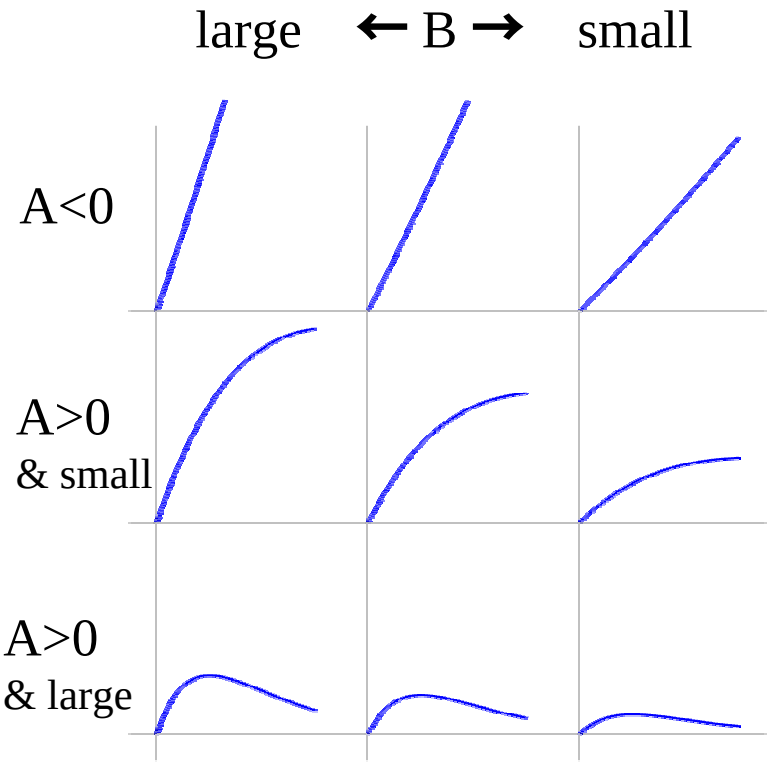
II Magnitude

III Seismic Intensity Distribution

I -1 Epicenter estimation from a single station

<< Extraction of waveform character → "A" & "B" >>

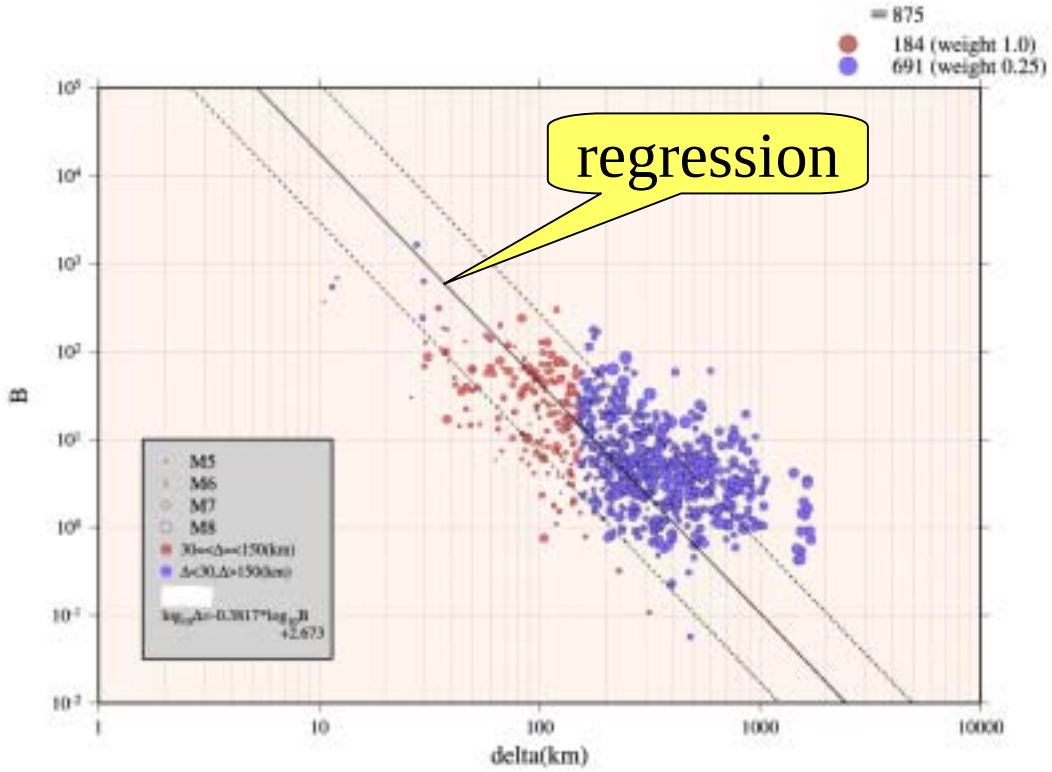




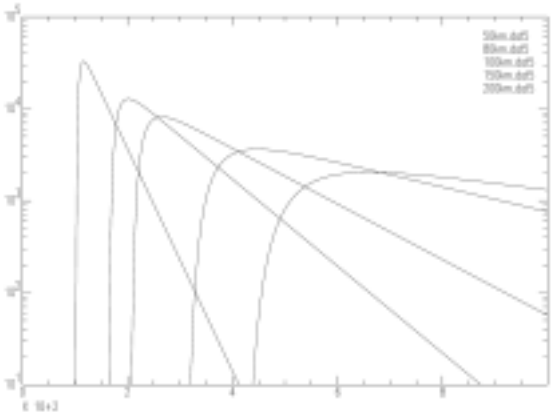
Ⅰ-1 Epicenter estimation from a single station

① Epicentral distance

Negative correlation between B & **Δ**

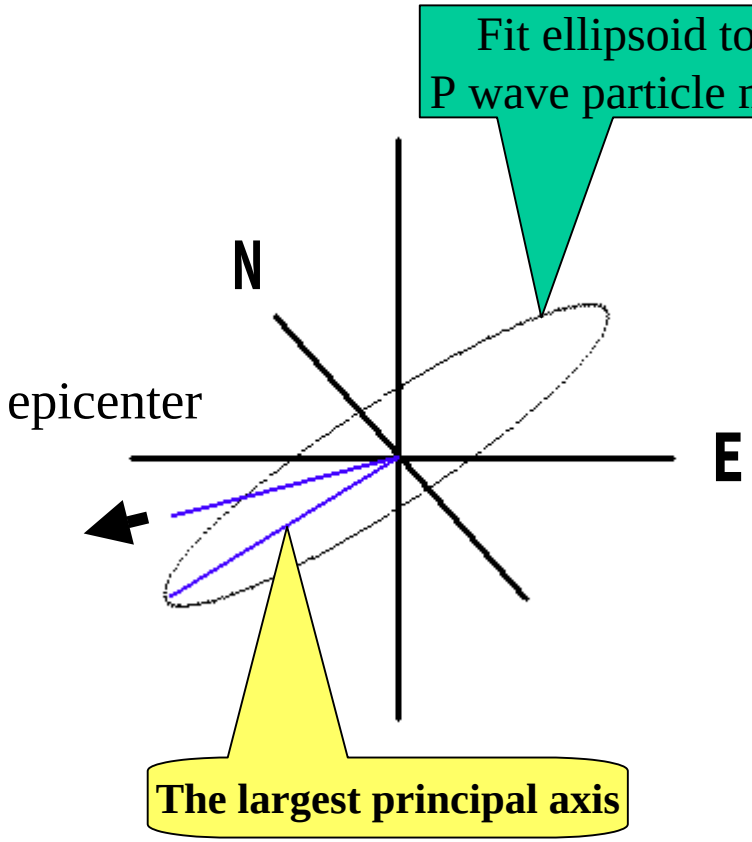


A model simulation of envelope shape deformation by a scattering

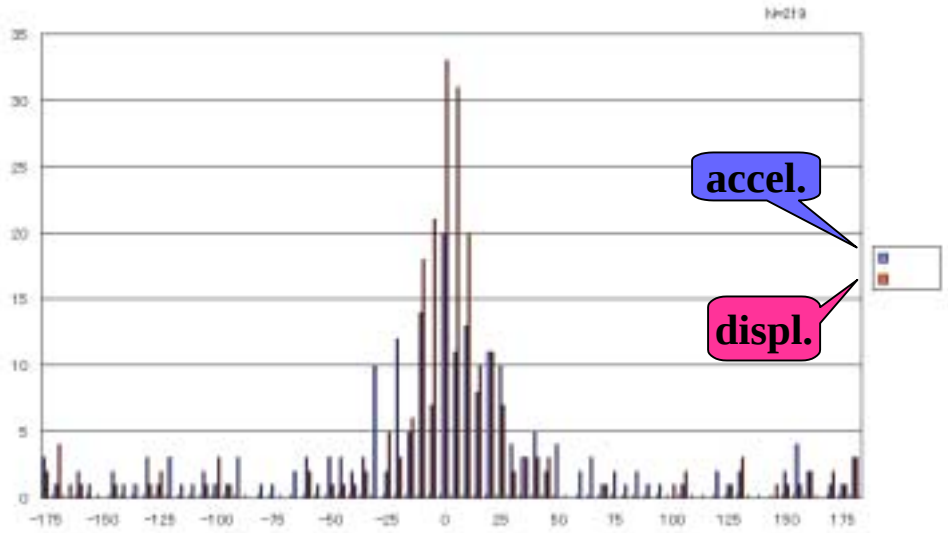


Ⅰ-1 Epicenter estimation from a single station

② Back azimuth to the epicenter

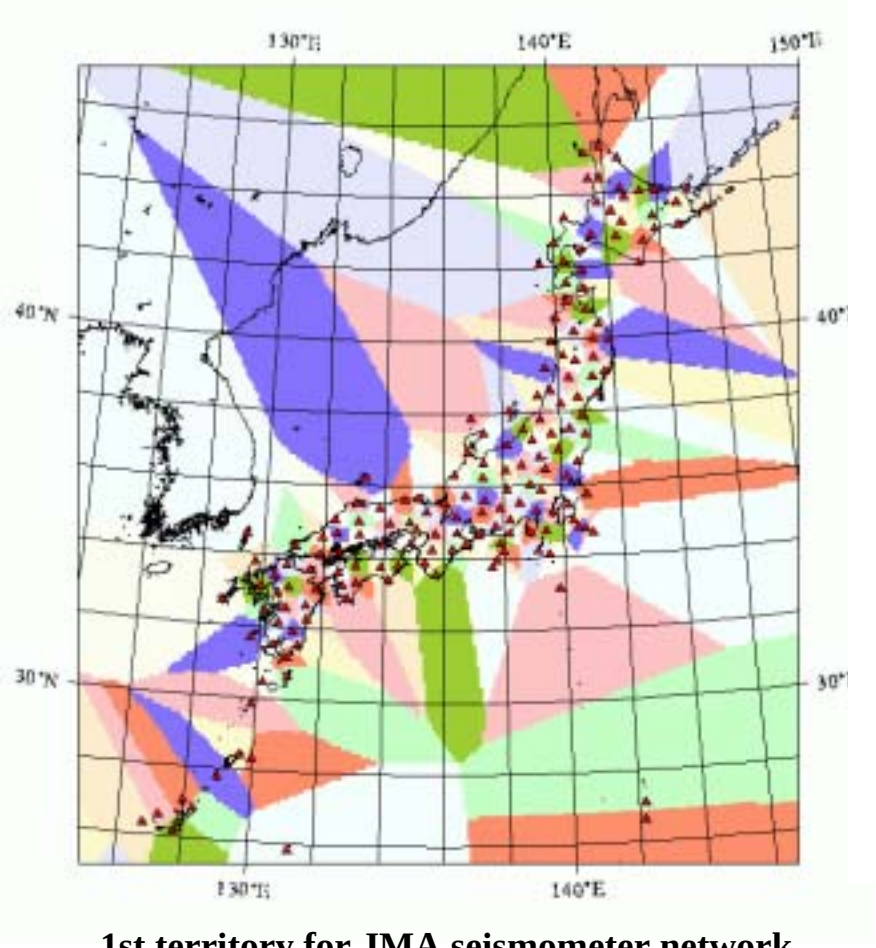


Azimuth estimation error frequency distribution

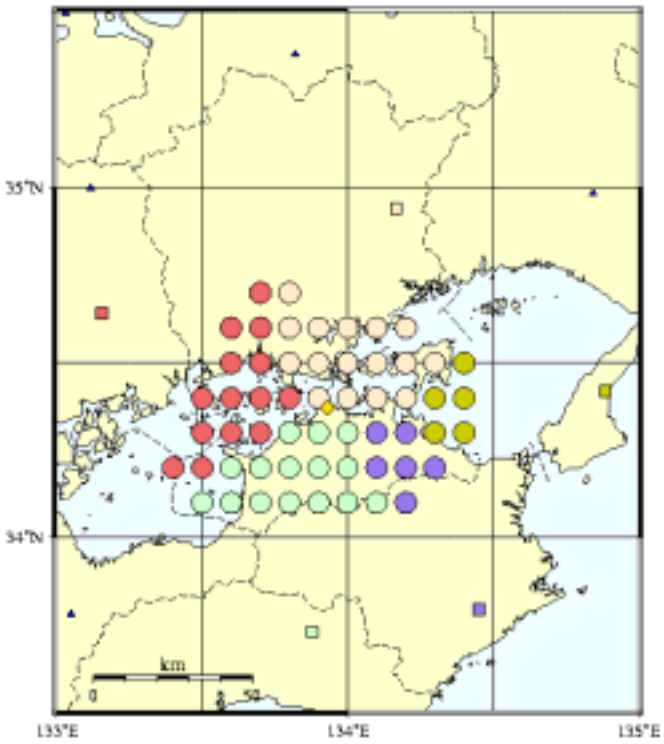


Ⅰ-2 Hypocenter estimation from a network

1) Territory method (# of sta. = 1 or 2)



1st territory for JMA seismometer network

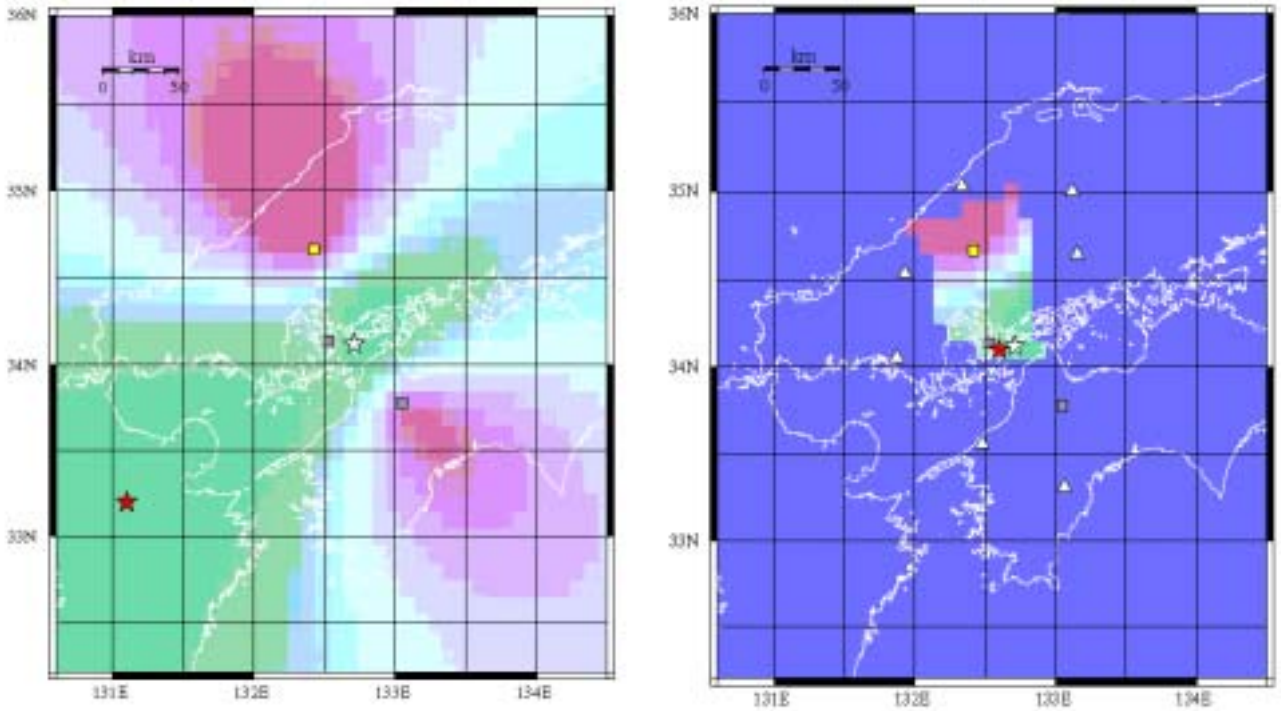


2nd territory for SAKAIDE sta.

Ⅰ-2 Hypocenter estimation from a network

2) Grid search method (# of sta. = 3 to 5)

2001.Mar.24 Geiyo earthquake (Mj=6.7)



Without area restriction

Area restriction done

P arrival time difference
→ Minimize (LS manner)

small ← Residual → large

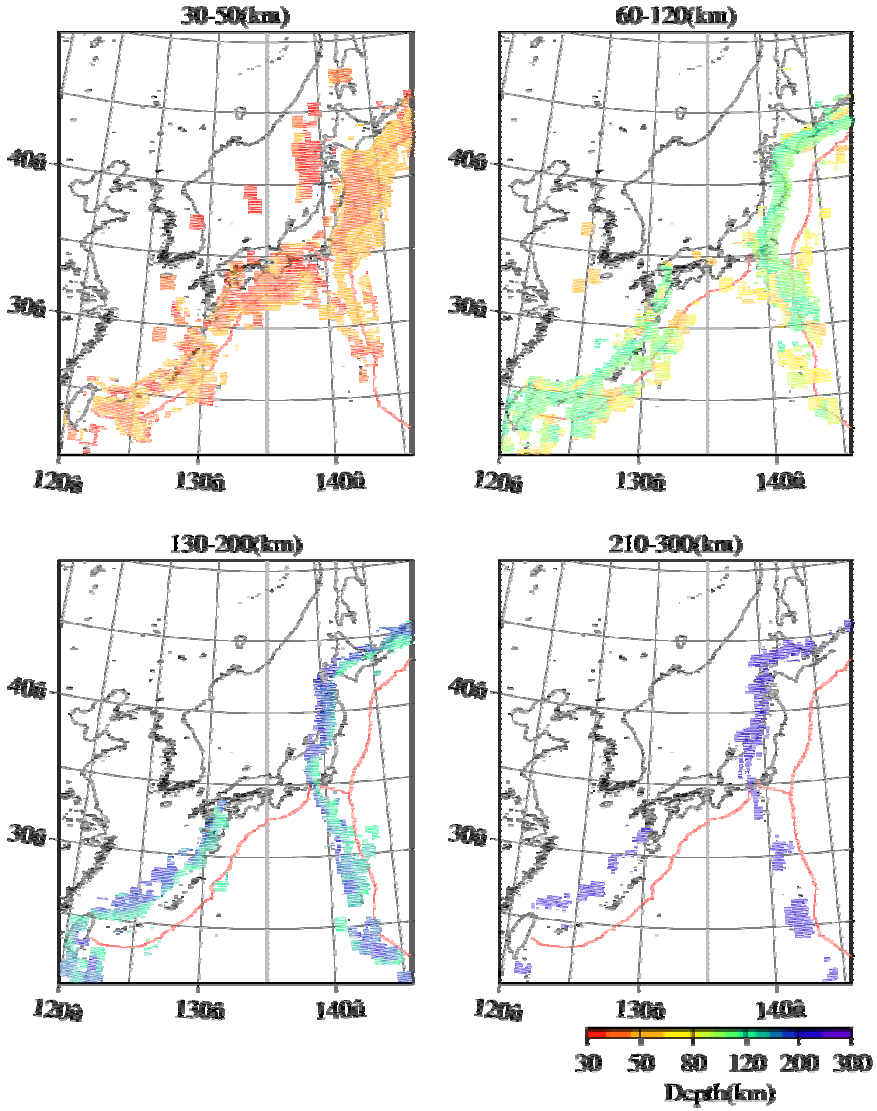
Ⅰ-2 Hypocenter estimation from a network

2) Grid search method
(# of sta. = 3 to 5)

Skip grids at aseismic depths

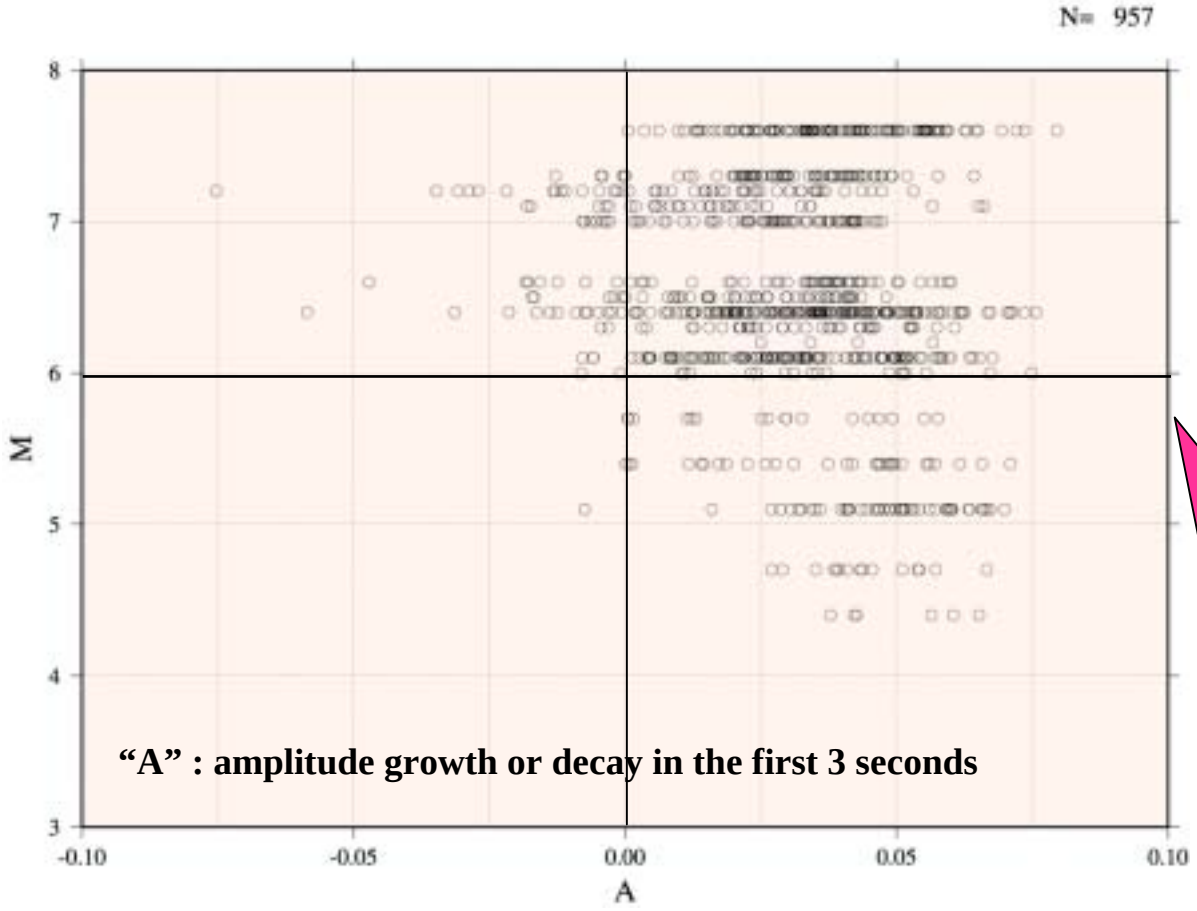
→ 1) Shorten calc. time

2) Get proper solution



II Magnitude estimation

① From the first 3 seconds



If A<0
(Amp. kept growing in 3 sec.)

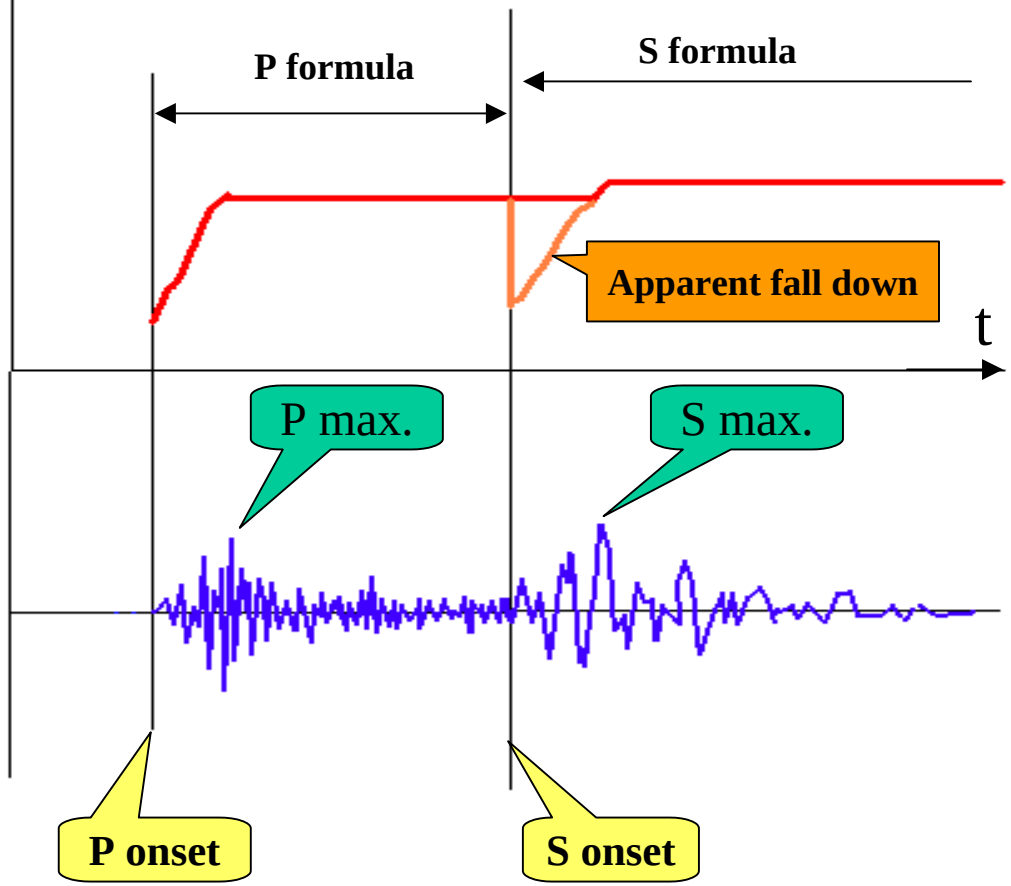
↓

Then M>6.0

II Magnitude estimation

② Update maximum amplitude → Update magnitude

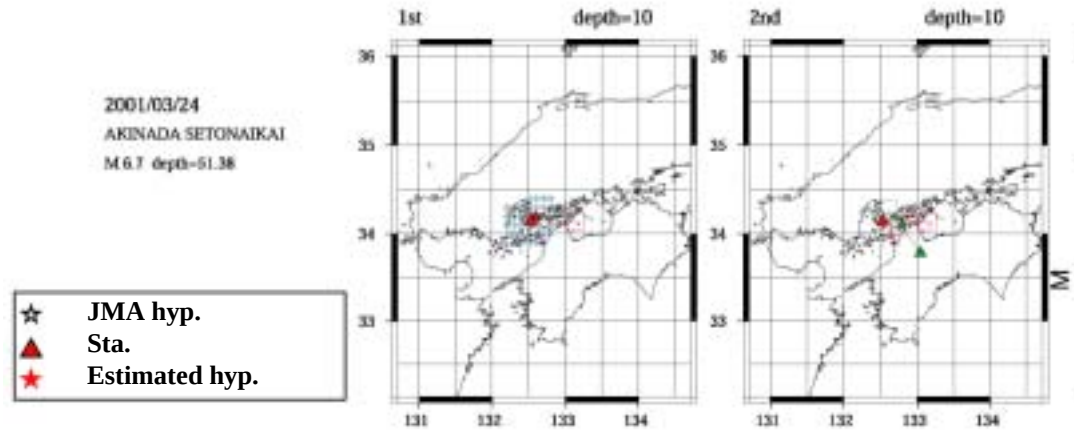
Magnitude = log(Amax) + logR + a1*R + a2



Amax

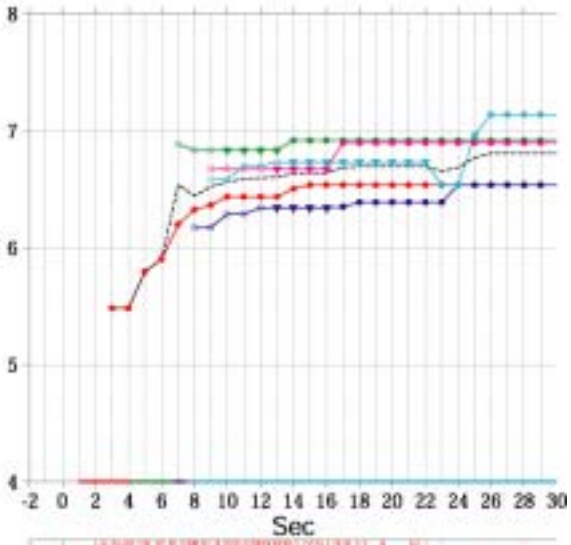
- **Displ.**
- **Vector sum of 3 comp.**

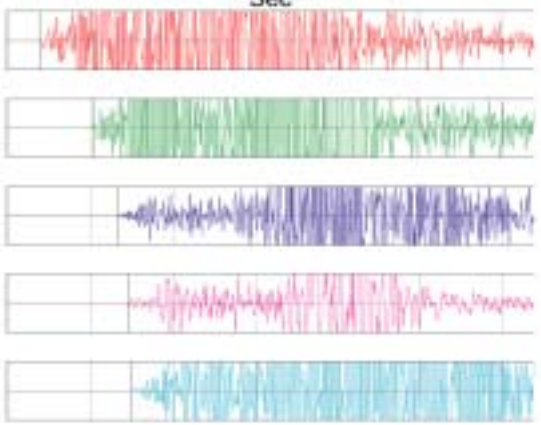
2001.Mar.24 Geiyo earthquake (Mj=6.7)



Hypocenter estimation

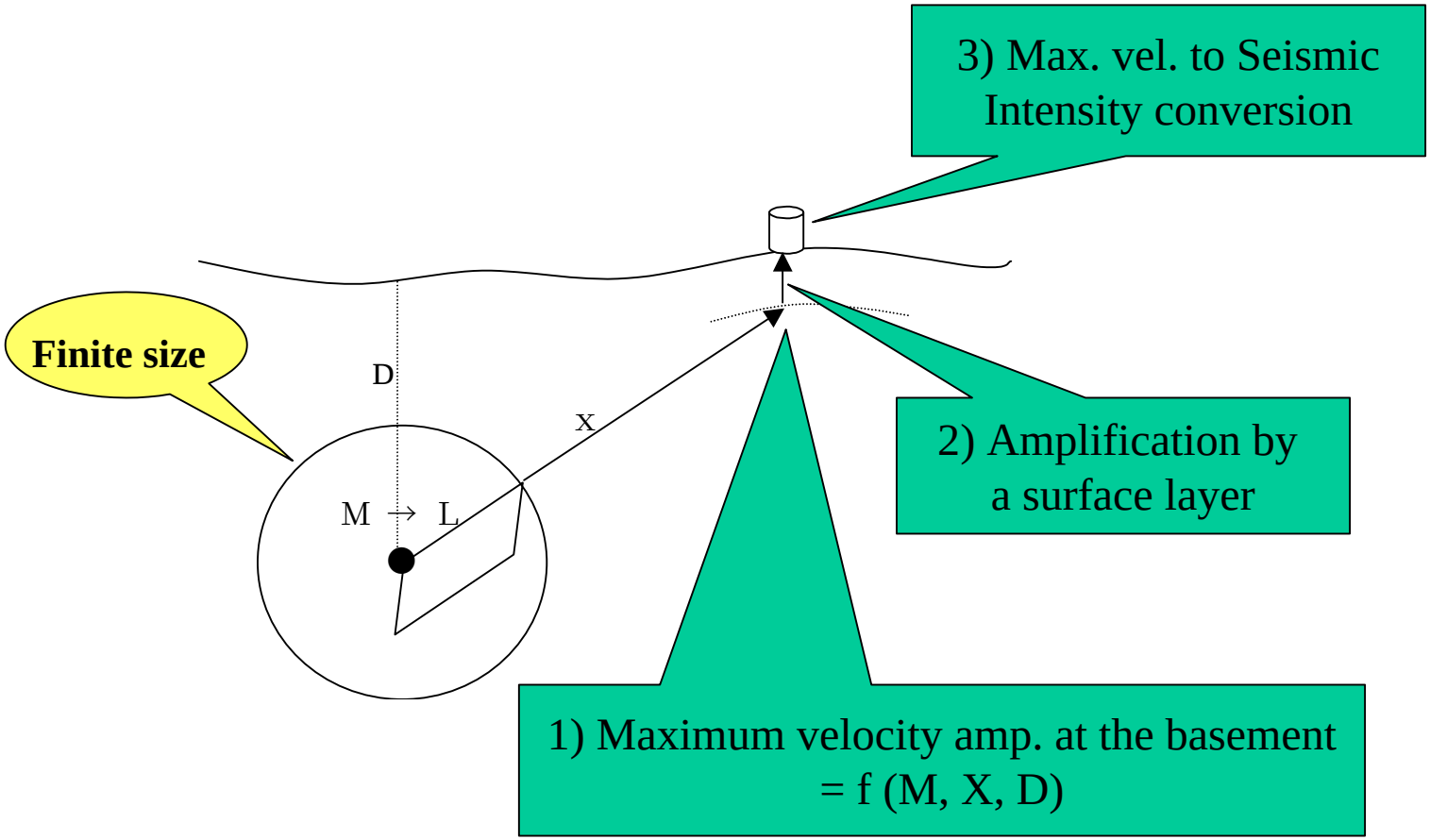
Magnitude





Waveform(accel. UD)

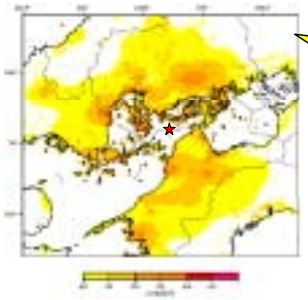
III Seismic intensity estimation



2001.03/24 Geiyo earthquake

34.1 ° N, 132.7 ° E, M6.7 ,51.4km

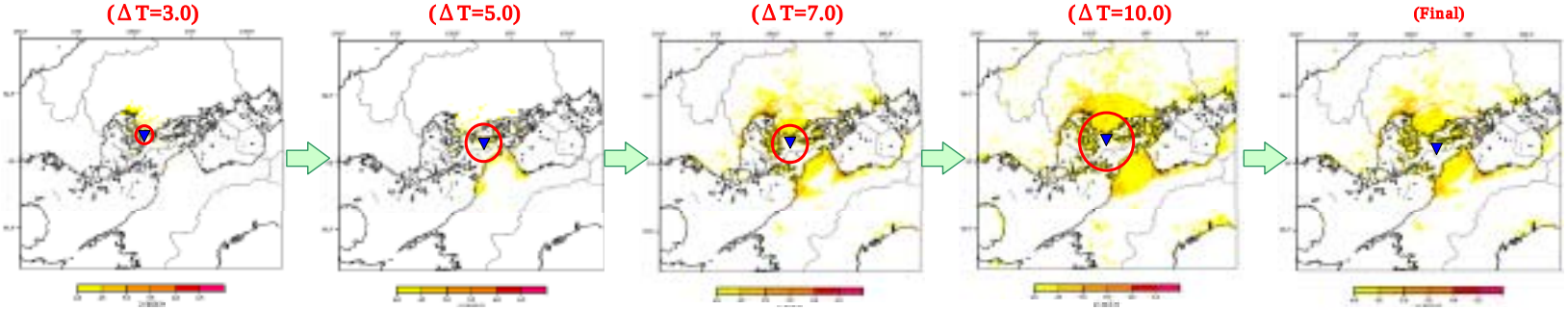
Tentative result



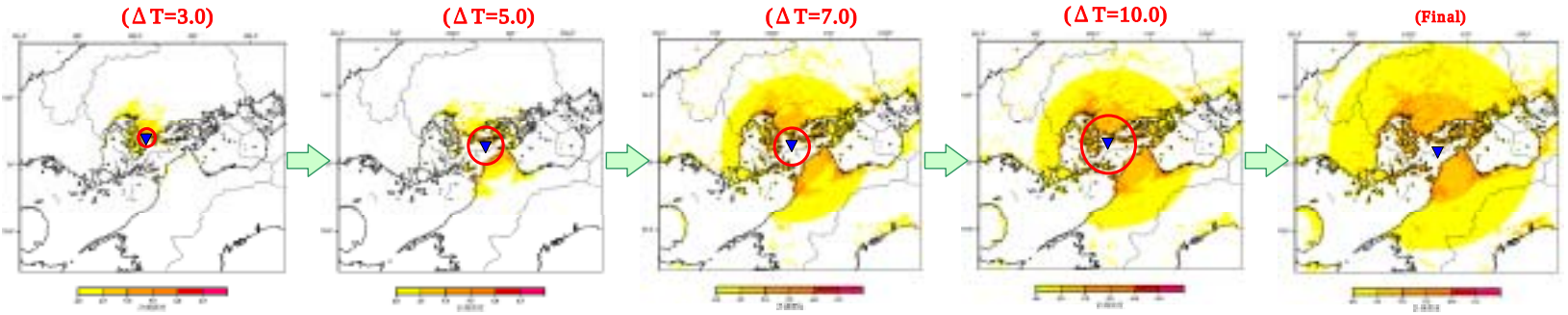
Seismic Intensity distribution estimation from Seismic Intensity Meter observation

Red circle denotes S wavefront

1． Finiteness of the focus NOT included



2． Finiteness of the focus included



JMA Nowcast Earthquake Information is,

a evolving information with time,

disseminated repeatedly with improved reliance,

& planed to start test dissemination from Autumn 2003.

Now making research for

- Optimum usage of the information corresponding to the timing & reliance
- Information transfer technology