QPF Hydro Symposium
Boulder, CO
5-8 June 2006

A Study on the Increase of Rainfall Associated with Typhoon Rananim over Inland

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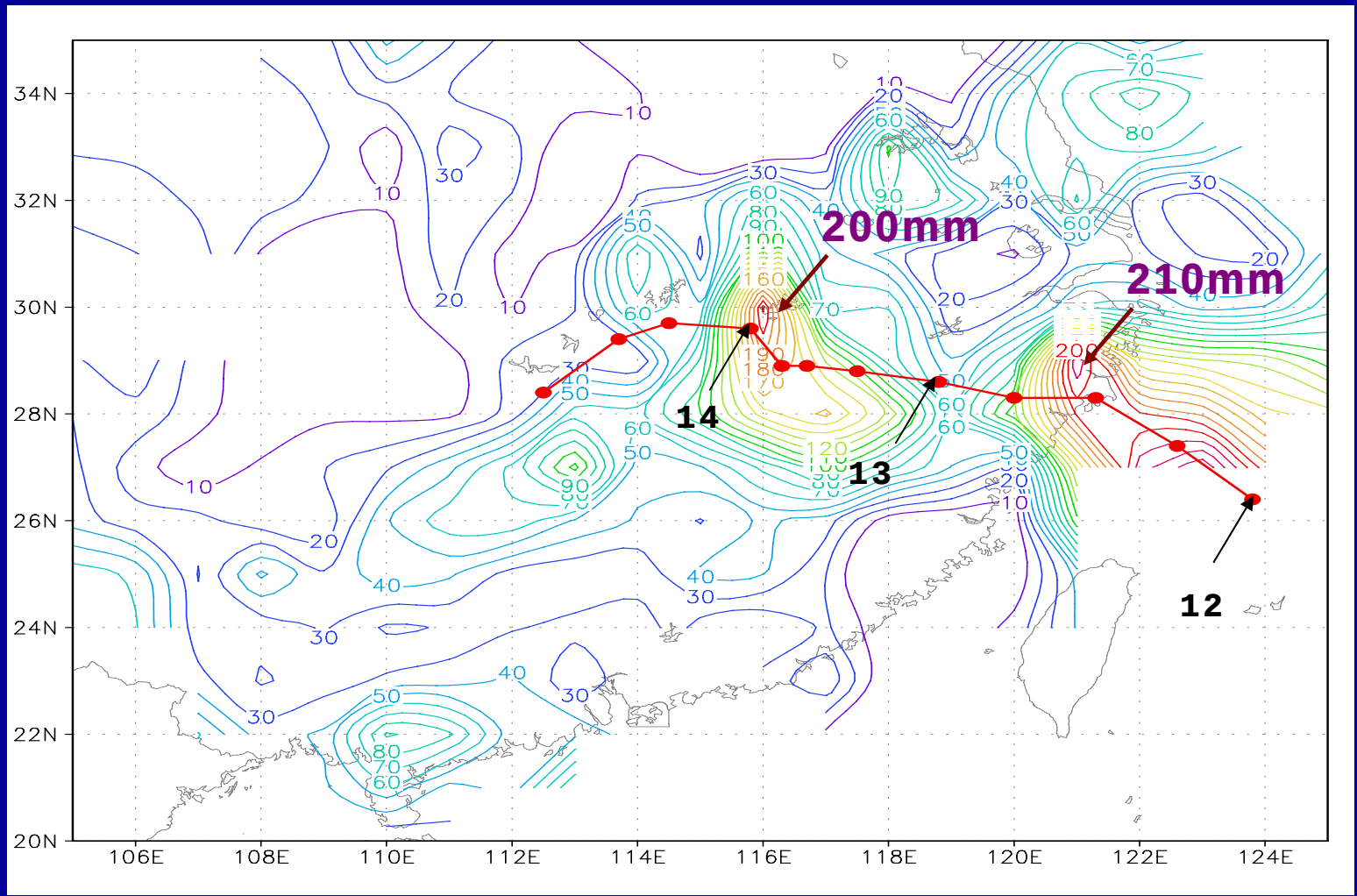
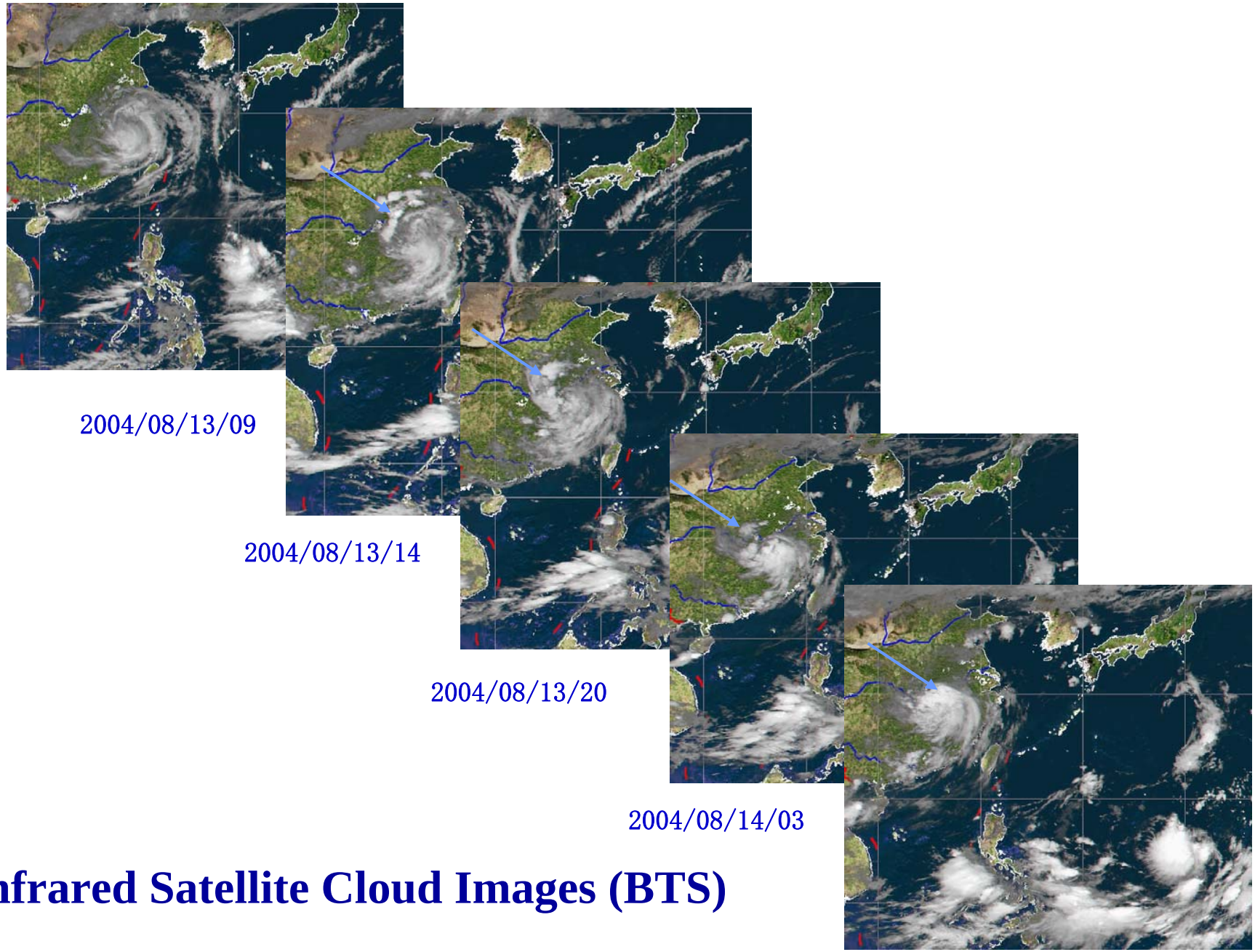
Accumulated Rainfall (mm) Distribution during Rananim's Landfall



08h 12 Aug. 2004 - 08h 15 Aug. 2004 (BTS)



2004/08/13/09

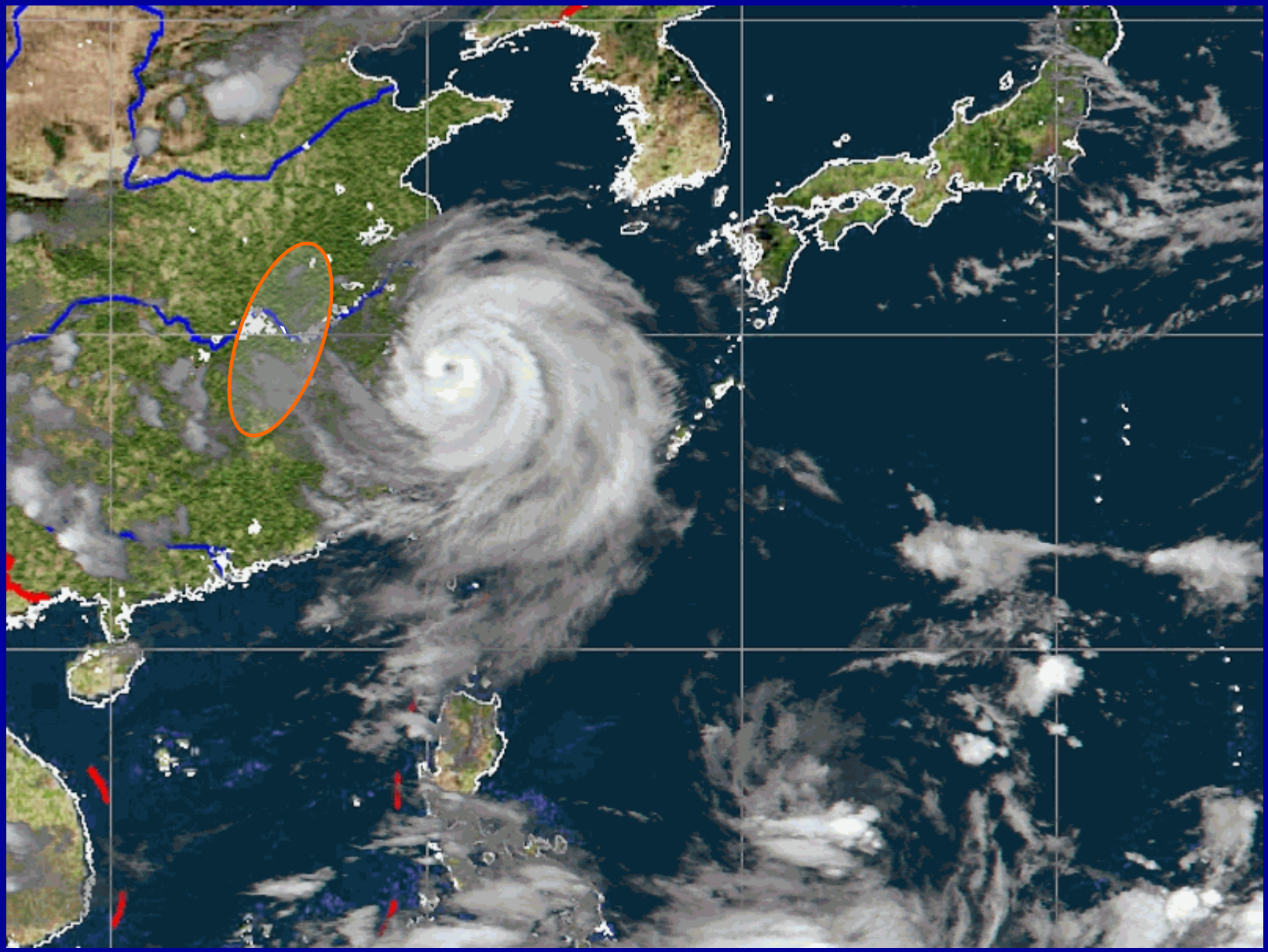
2004/08/13/14

2004/08/13/20

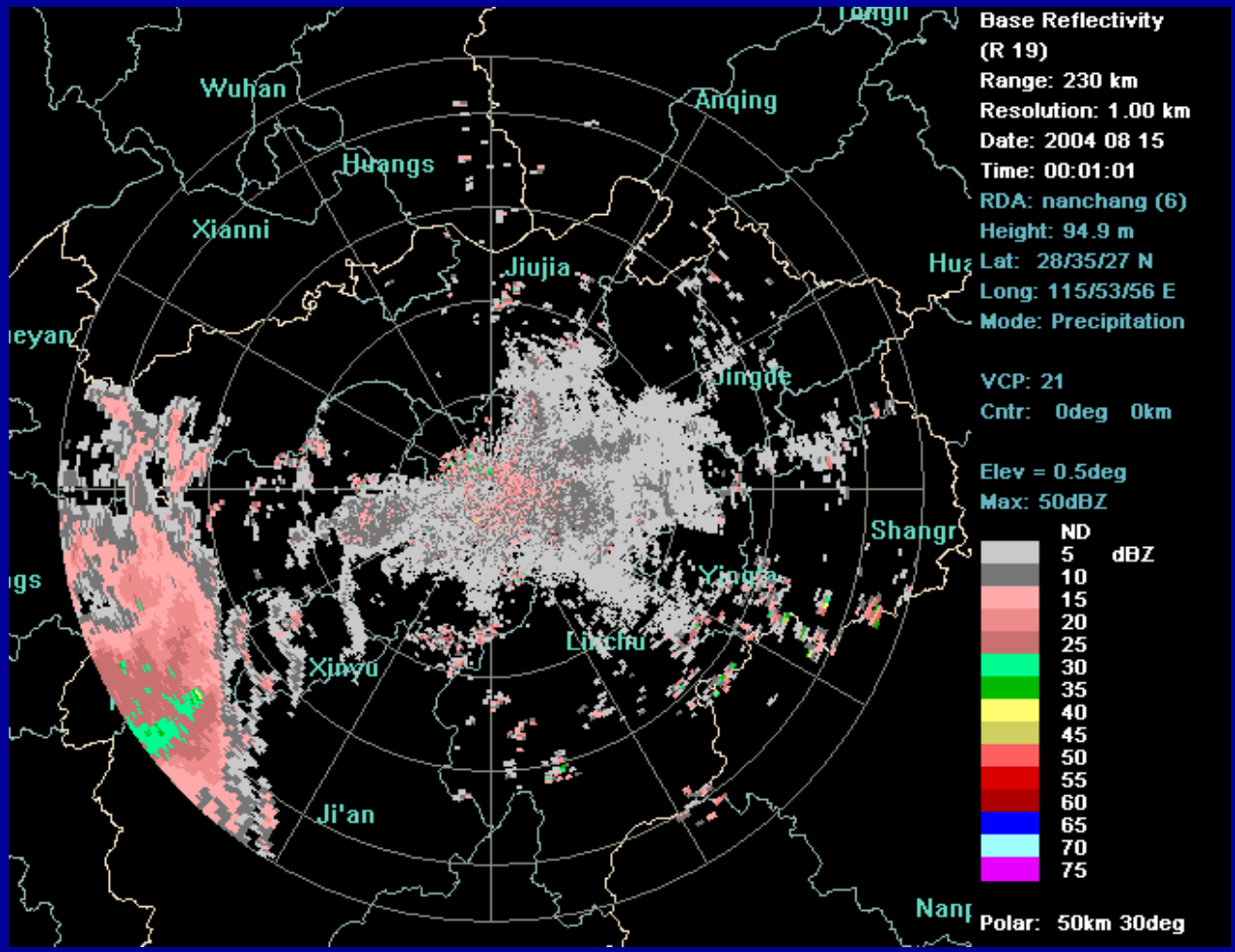
2004/08/14/03

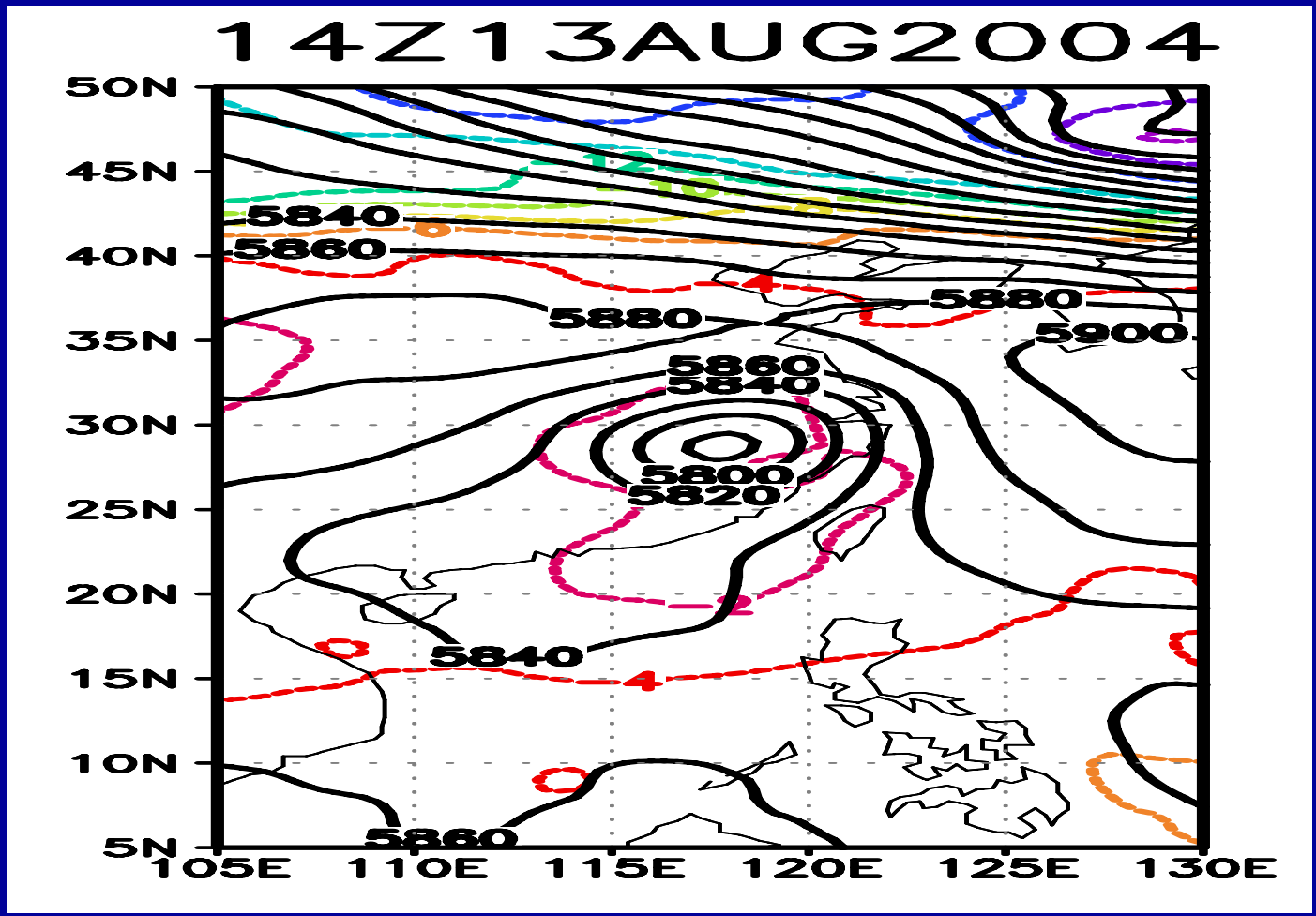
2004/08/14/08

Infrared Satellite Cloud Images (BTS)

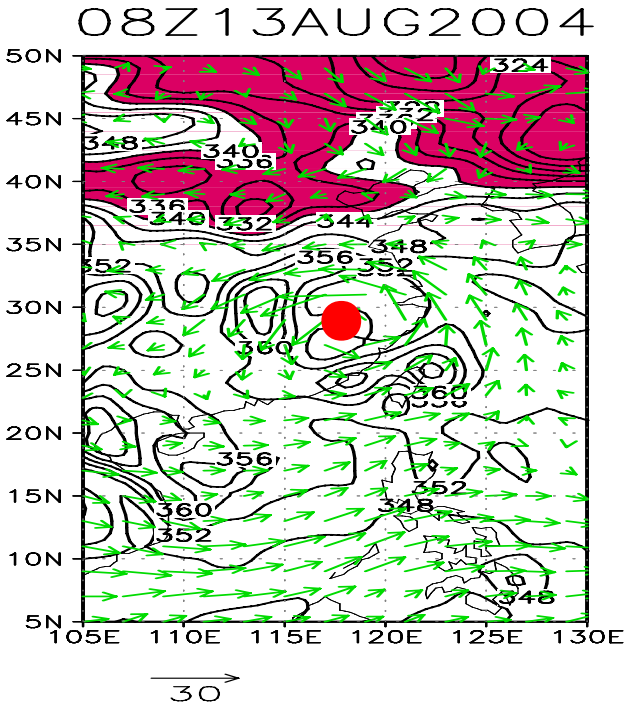


Doppler Radar Observation in Nanchang

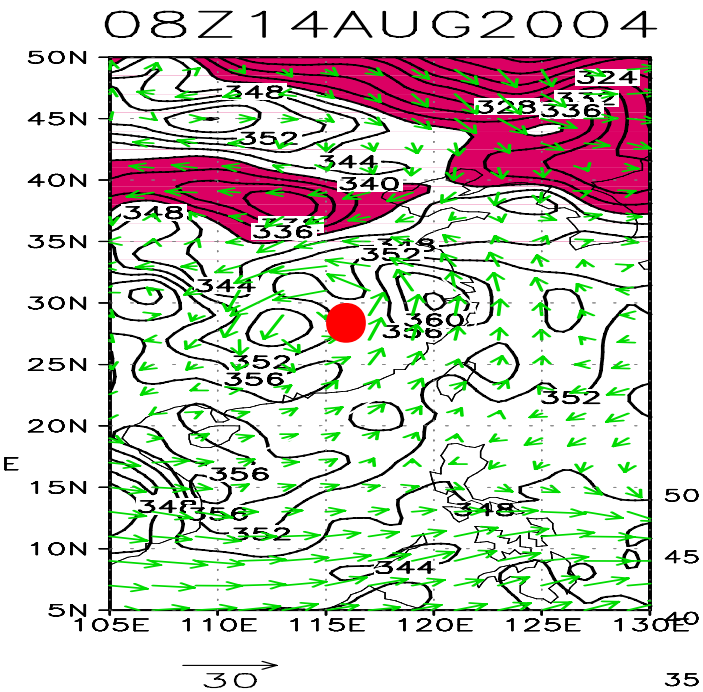


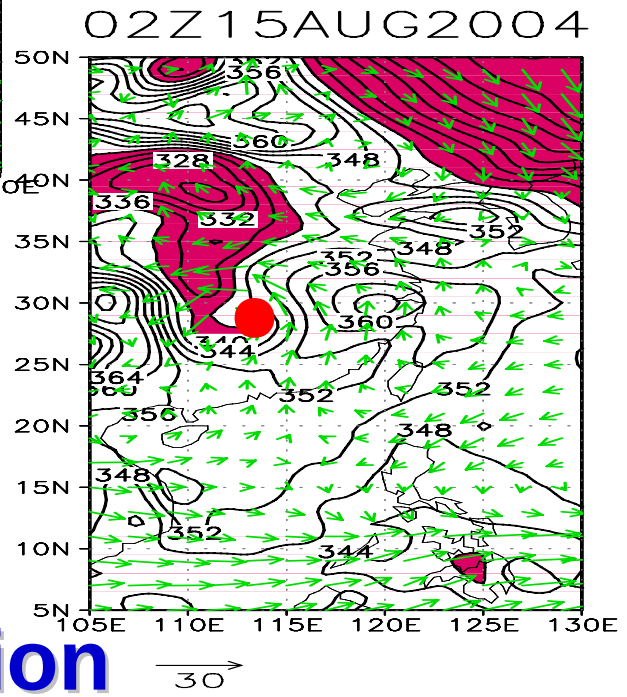


Geographic Potential Height (Solid Line) and Temperature (Broken Line) Field on 500hPa.

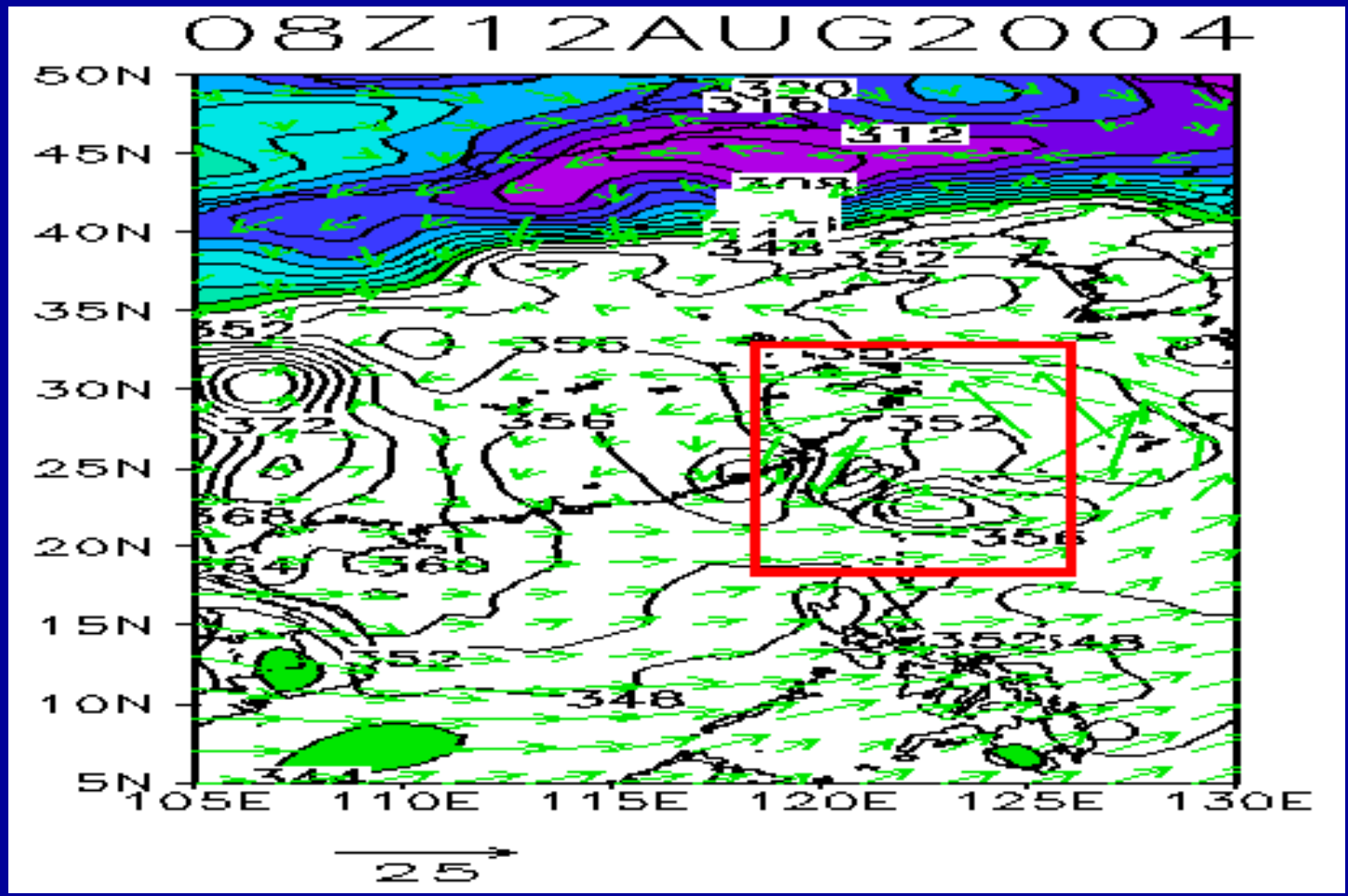


850hPa



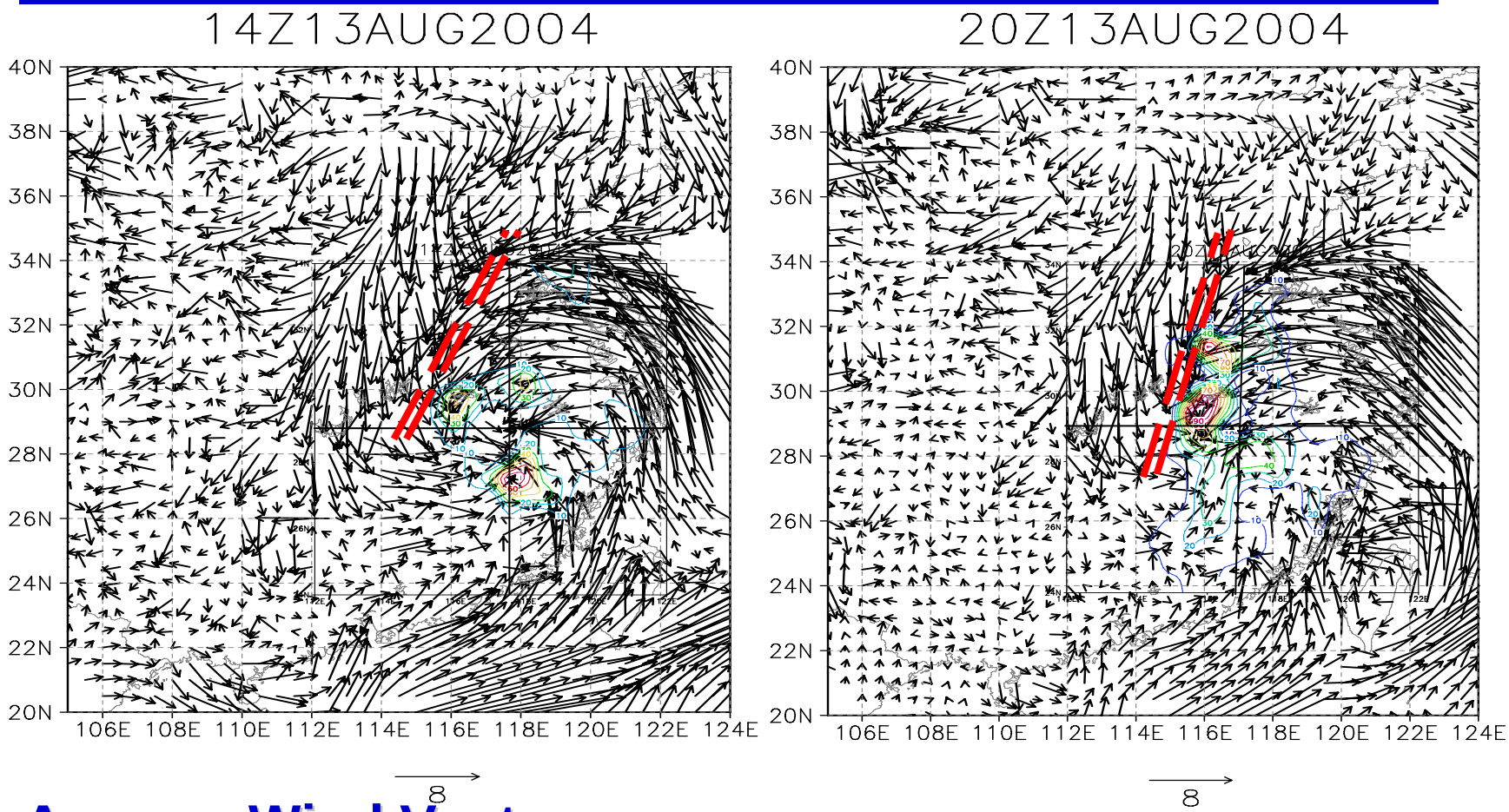


Wind vectors and equivalent potential temperature distribution (K , shaded≤ 340K)



Animation Intrusion Process of Cold Air on Lower Layer

Intensive Surface Observation



- **Arrows: Wind Vectors**
- **Double Broken Lines：Convective Lines**
- **Colored Lines：6-hour Accumulated Rainfall (only>10mm)**

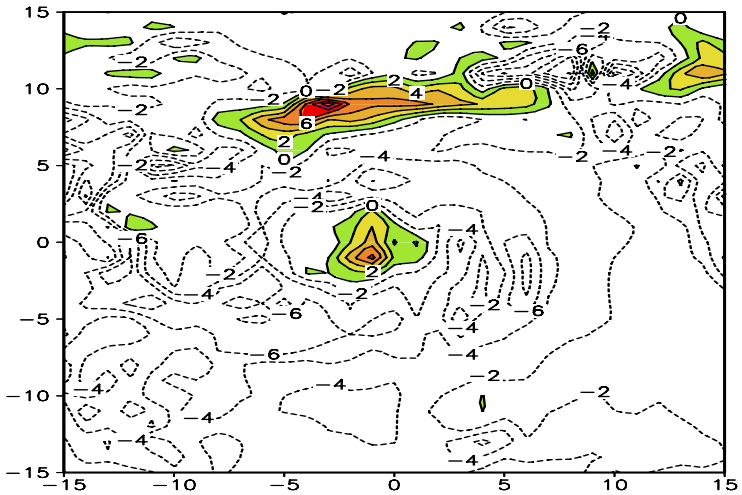
Moist Potential Vorticity (MPV)

$$\frac{dP_m}{dt} = 0$$

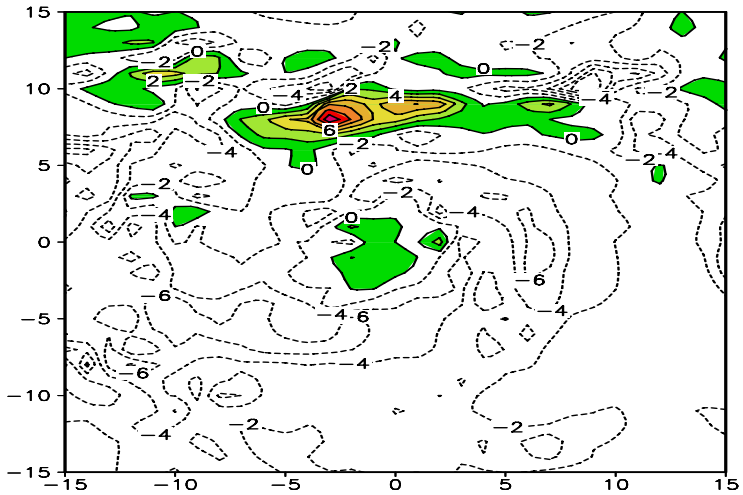
$$P_m = \alpha \vec{\zeta}_a \cdot \nabla \theta_e$$

$$P_m = P_{m1} + P_{m2} = -g(\zeta_p + f)\frac{\partial \theta_e}{\partial p} - gk \times \frac{\partial \vec{v}}{\partial p} \cdot \nabla_p \theta_e$$

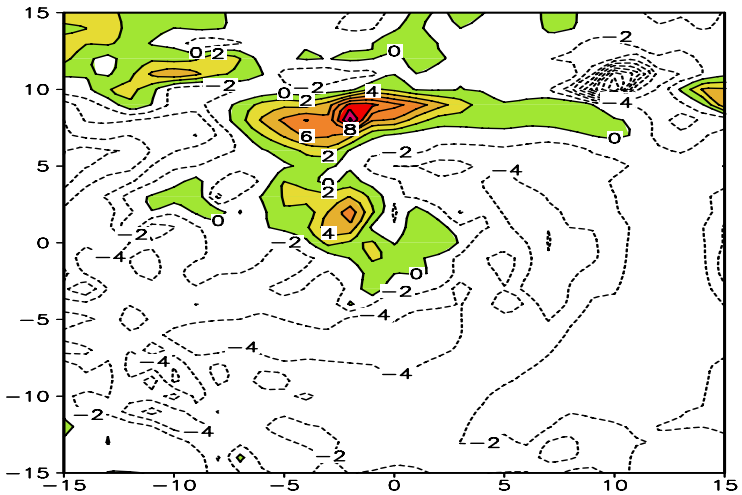
2004/08/13/14



2004/08/13/20



2004/08/14/02



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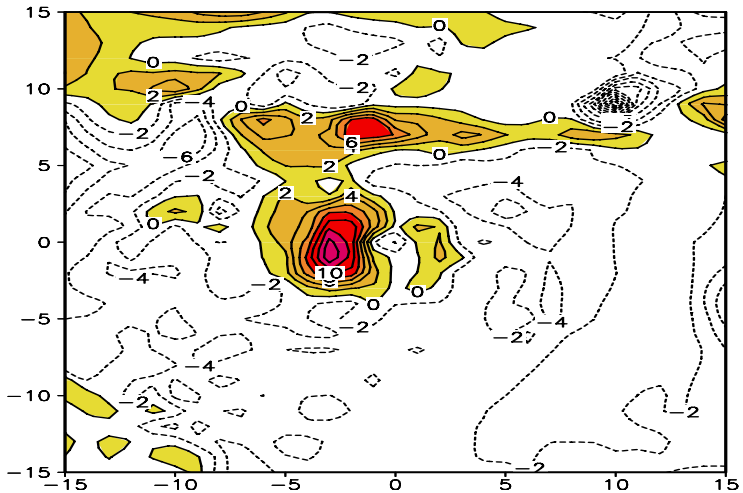
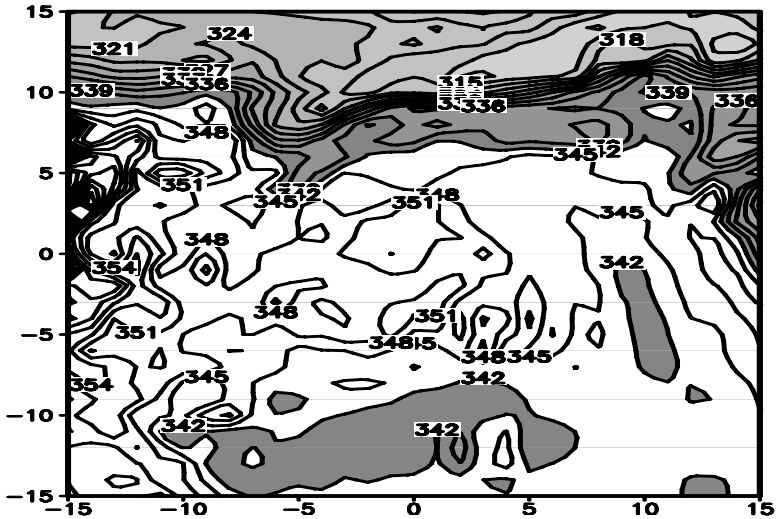


Period MPV (unit:0.1PVU) distributions on 850hPa

Equivalent potential temperature distributions (shaded <342K) on 850 layer

2004/08/13/14



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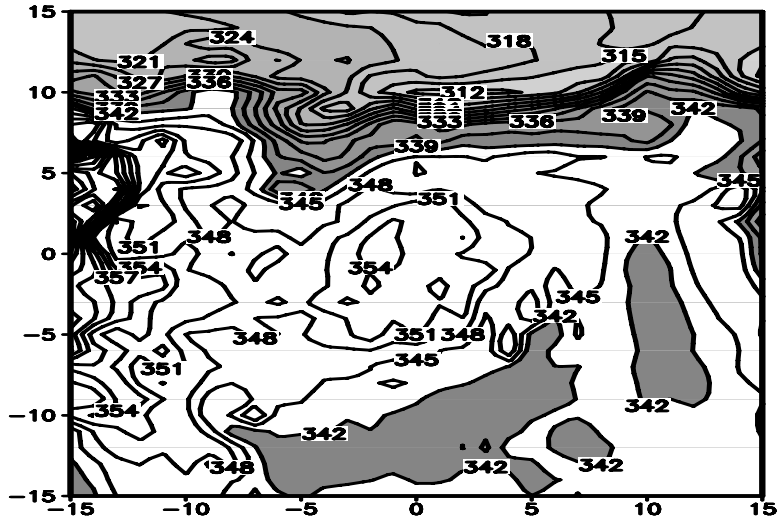

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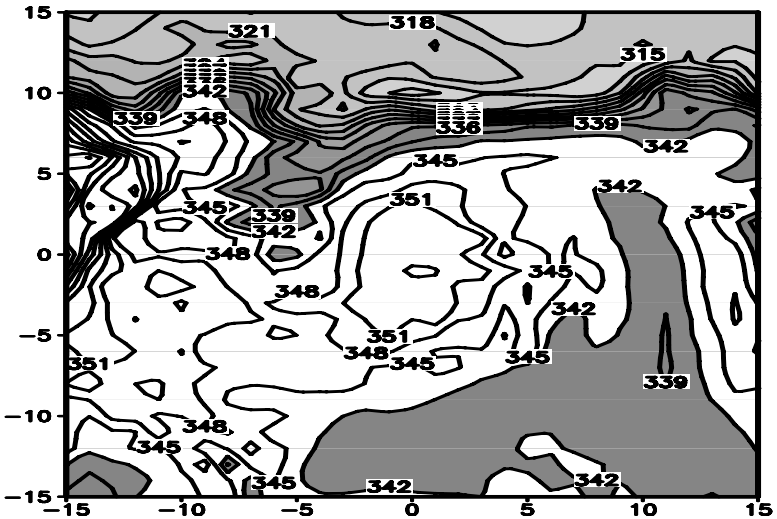

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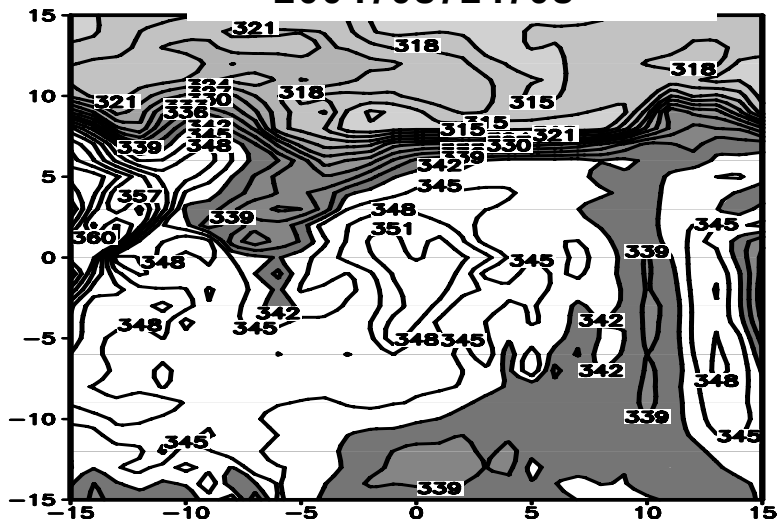
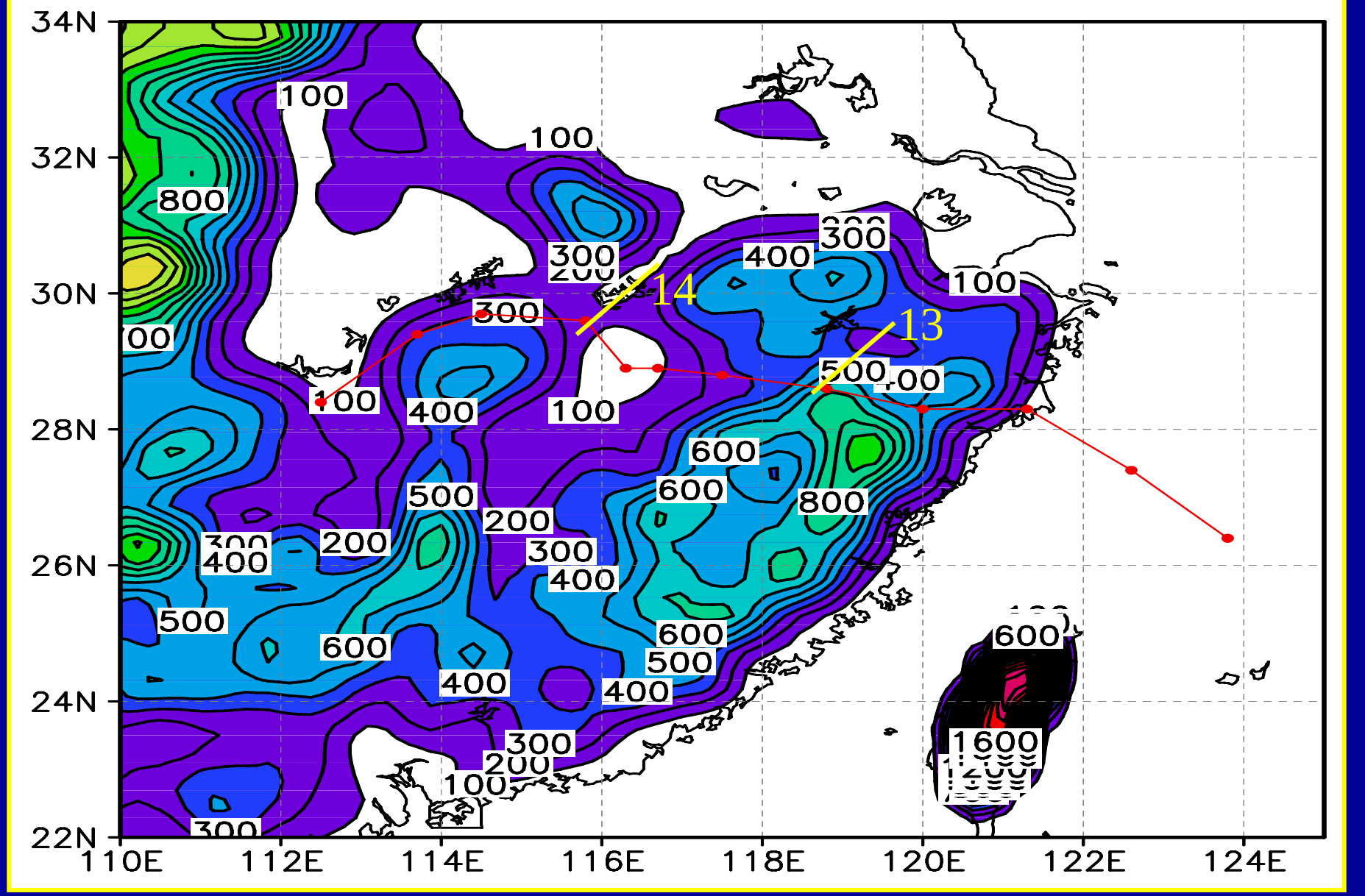
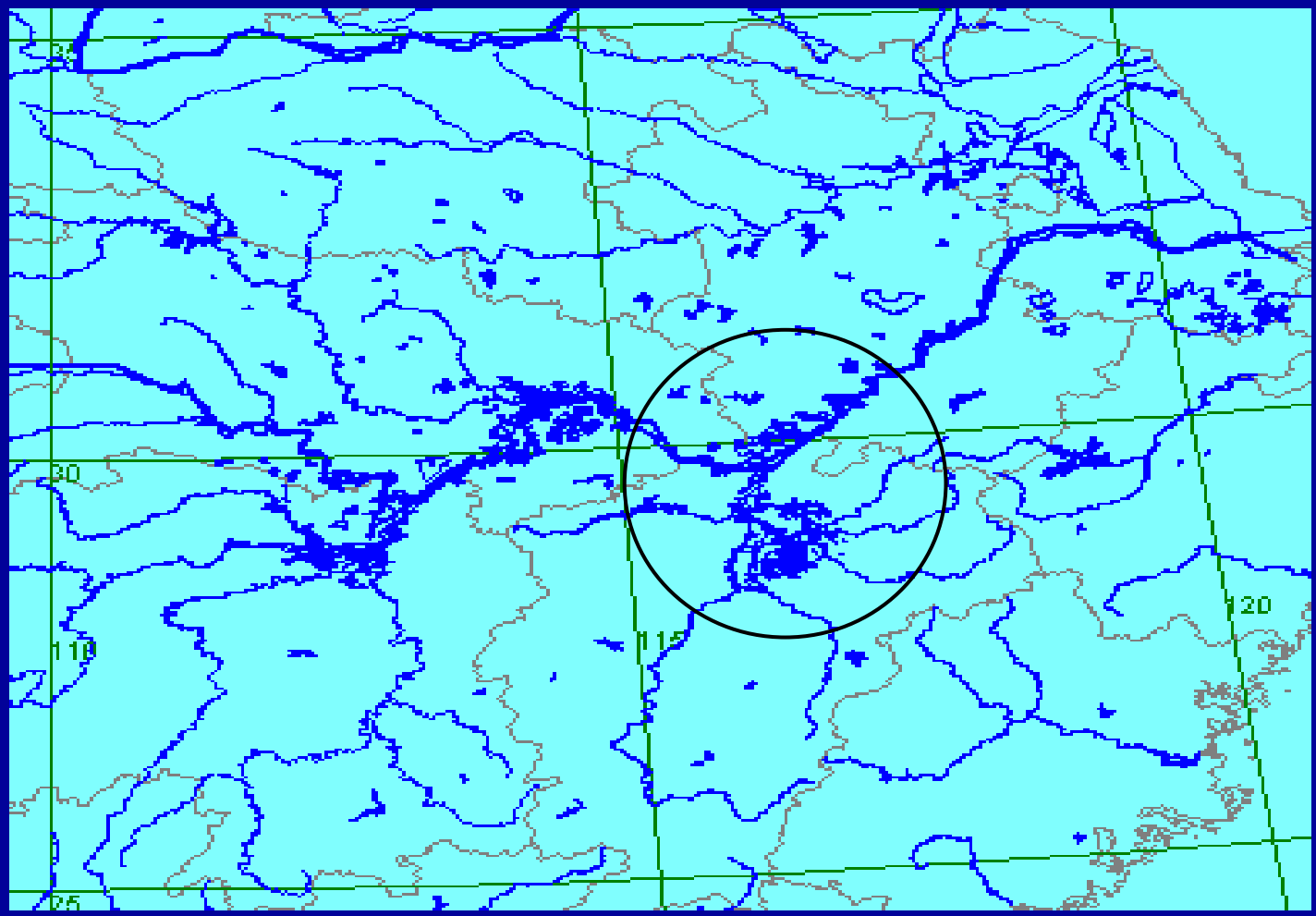




Topographic Height (m)



The lakes and main rivers in eastern China

Conclusion

- **Mesoscale convective activities are responsible for the increase of rainfall over inland.**

- **The inland heavy rainfall is related to the entrance and increase of positive MPV in typhoon circulation.**

- **The impacts of underlying terrain may play an important role in the rainfall increase.**

Thank you !