Storm Initiation Locations during TiMREX for Weakly Forced Synoptic Situations

James Wilson and Tracy Emerson
NCAR
Overall Arching Goal

Collaboratively Develop with CWB a Heavy Rain Nowcasting System For Taiwan
Climatology

Frequency of reflectivity > 35 dBZ

14 L

15 L

16 L

17 L

18 L

19 L

Pin-Fang Lin, Pao-Liang Chang, Ben Jong-Dao Jou

Also Tong, Chong-Chi
Frequency of reflectivity >35 dBZ
Hovmöller diagram

Pin-Fang Lin, Pao-Liang Chang, Ben Jong-Dao Jou  Also  Tong, Chong-Chi
During TiMREX have identified 22 days with afternoon thunderstorms with a minimum of synoptic scale forcing.

May 17, 18, 22, 23, 24, 25, 26, 28

Work in Progress

- determine boundary layer, mountain top, and steering level wind velocity
- determine stability
3 Consecutive Days During TiMREX

June 7

S-Pol Radar Reflectivity

June 8

1600 Local
Same Place Same Time

June 9

topography
June 7
June 13
07 June 2008

Winds 11 L

CI between 14-17 L

Winds @11 L
~ 500 m height 200/7 m/s
3km height 255/7 m/s

CIN 95
CAPE 424
08 June 2008  03 UTC

Winds 14 UTC  no 11 L winds from soundings

Cl between 10-18 L

Winds @14 L
~ 300 -500 m height  190/7 m/s
3km height  255/5 m/s

CIN 12
Cape 1464
09 June 2008

Winds 11 L

Cl between 11 - 20 L

Winds @11 L
~ 500 m height 190/11

3 km height  190/6 m/s

CIN 11
Cape 747
13 June 2008

Winds 14 L

Cl between 12 - 17 L

Winds @ 14 L
~ 500 m height  180/09

3 km height  210/10 m/s

CIN 19
Cape 624
What About the hotspot near Taipei

Pin-Fang Lin, Pao-Liang Chang, Ben Jong-Dao Jou

Also Tong, Chong-Chi
June 19

Climatological afternoon frequency
Peak of 35+ dBZ
Existing Instrumentation

June 9

WSR88D
600m high

Radiosounde
Examples of initiation near Taipei
Examples of initiation near Taipei
Examples of initiation near Taipei
Converging air flow into Taipei basin

• Need to carefully map and relate to initiation
• Depth of these low-level flows
How to proceed?

1. Learn from Taiwan forecasters and researchers
2. High quality wind analysis (VDRAS)
3. Develop predictors for nowcasting system
4. Future experiments?
Thoughts on a proposed experiment for northern Taiwan

Objective: Through improved scientific understanding develop convective storm nowcasting techniques for northern Taiwan with the emphasis on weakly forced synoptic situation.

Time: 2011 and 2012
Proposed Instrumentation Enhancement

Supplement with 1200 L and 1500 L sounding
Proposed Instrumentation Enhancement

Check surface station exposure and quality

Add more stations ★