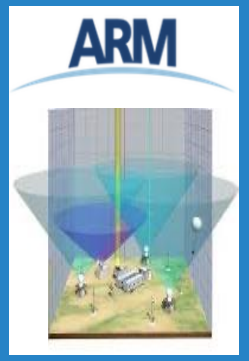
ASR Atmospheric System Research

Science Focus Area (SFA)

Tying in High Resolution E3SM with ARM Data (THREAD)

Lawrence Livermore National Laboratory



THREAD

LLNL ASR SFA

THREAD and LASSO

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THREAD's RRM-SCREAM configurations

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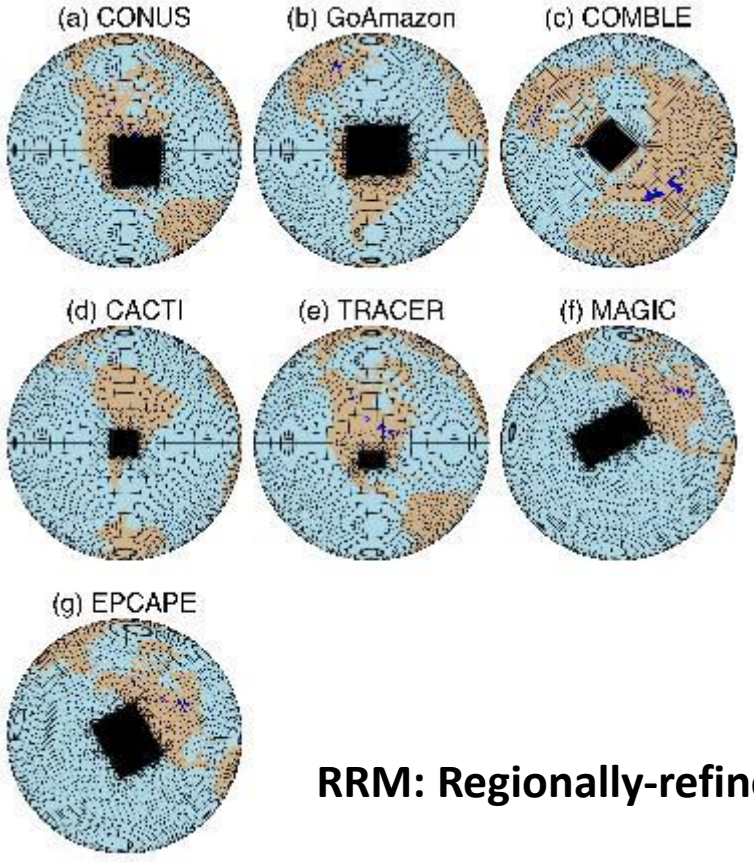
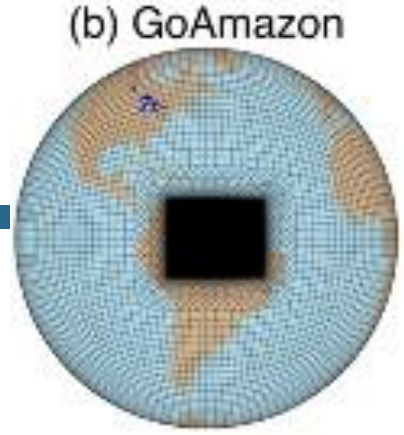
- RRM: An effective and efficient tool for high-resolution model development and diagnosis
- Seven RRM-SCREAM configurations are created to study convection over land, marine low clouds and land-atmosphere interactions in THREAD

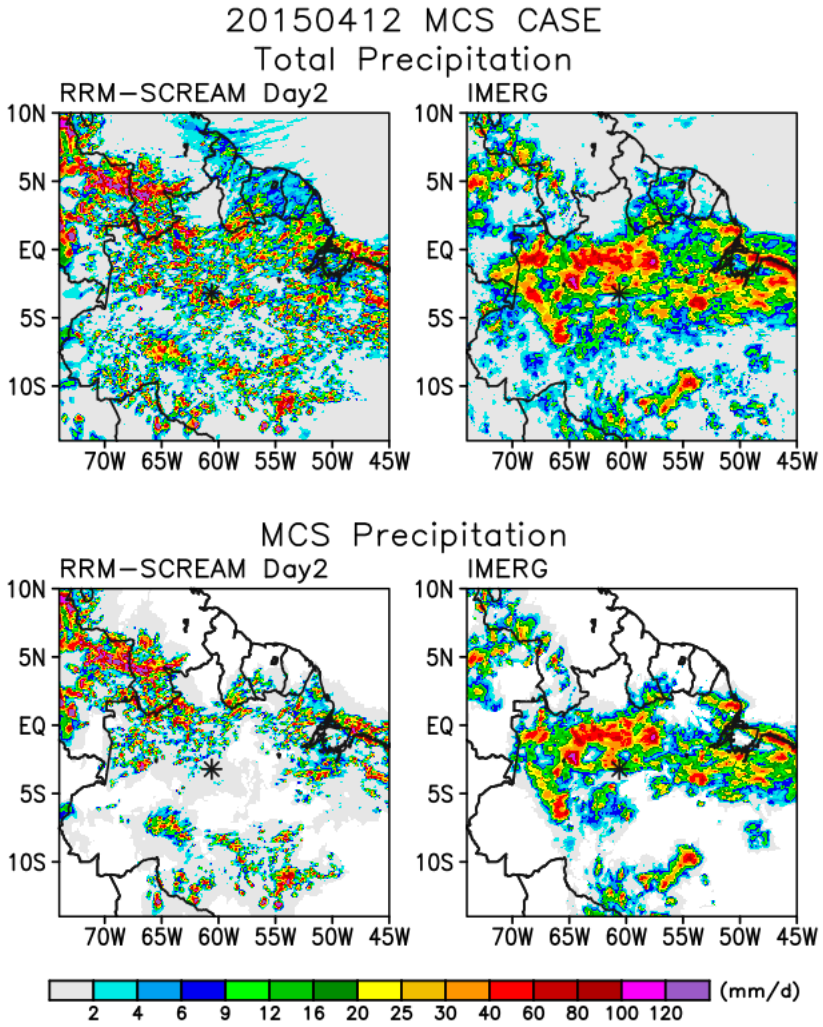
RRM-SCREAM configurations

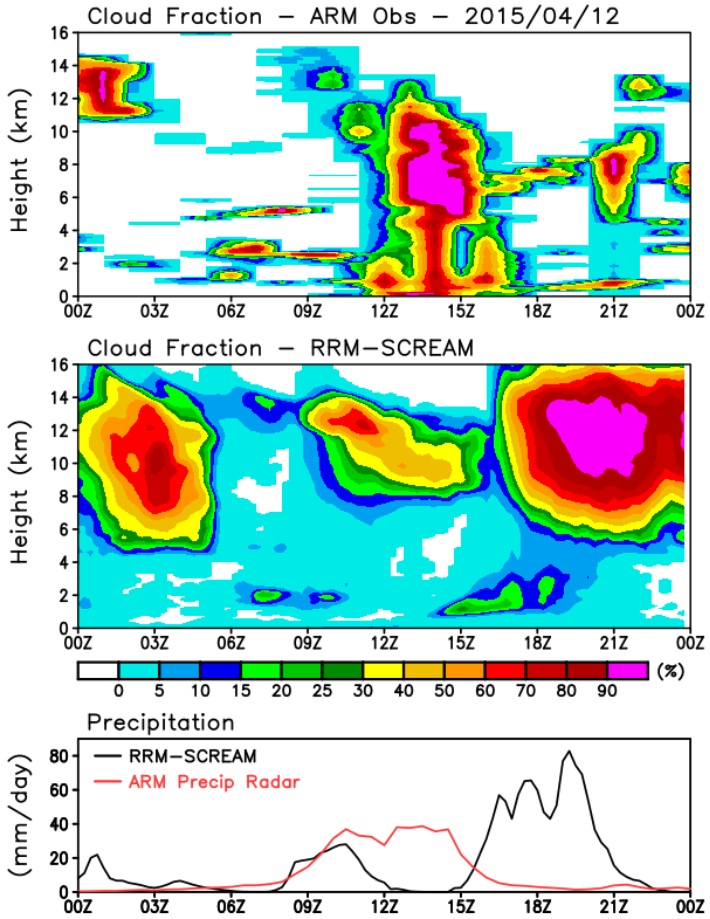


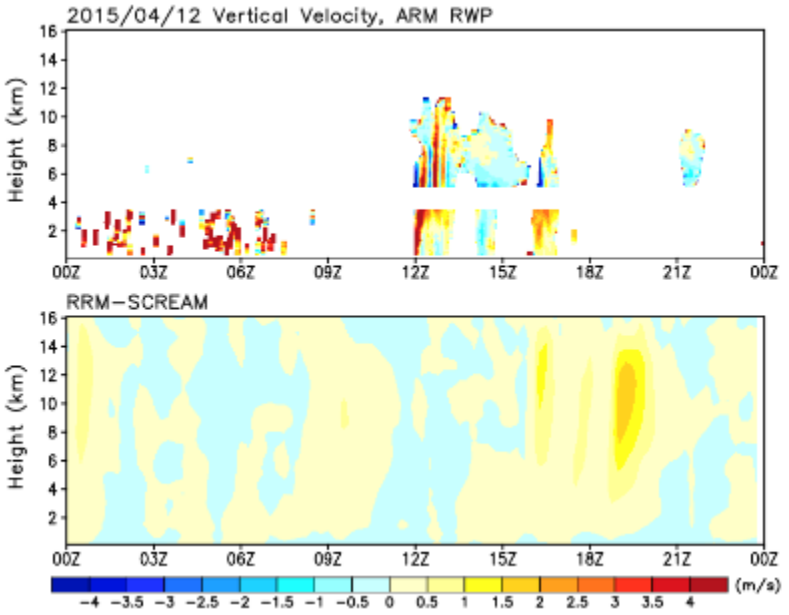
RRM: Regionally-refined Model

GoAmazon MCS case study









- ARM Obs are very useful
- But, we still need more to better understand 3D storm structure!

CACTI deep convection case study using LASSO as benchmark

by Tianning Su

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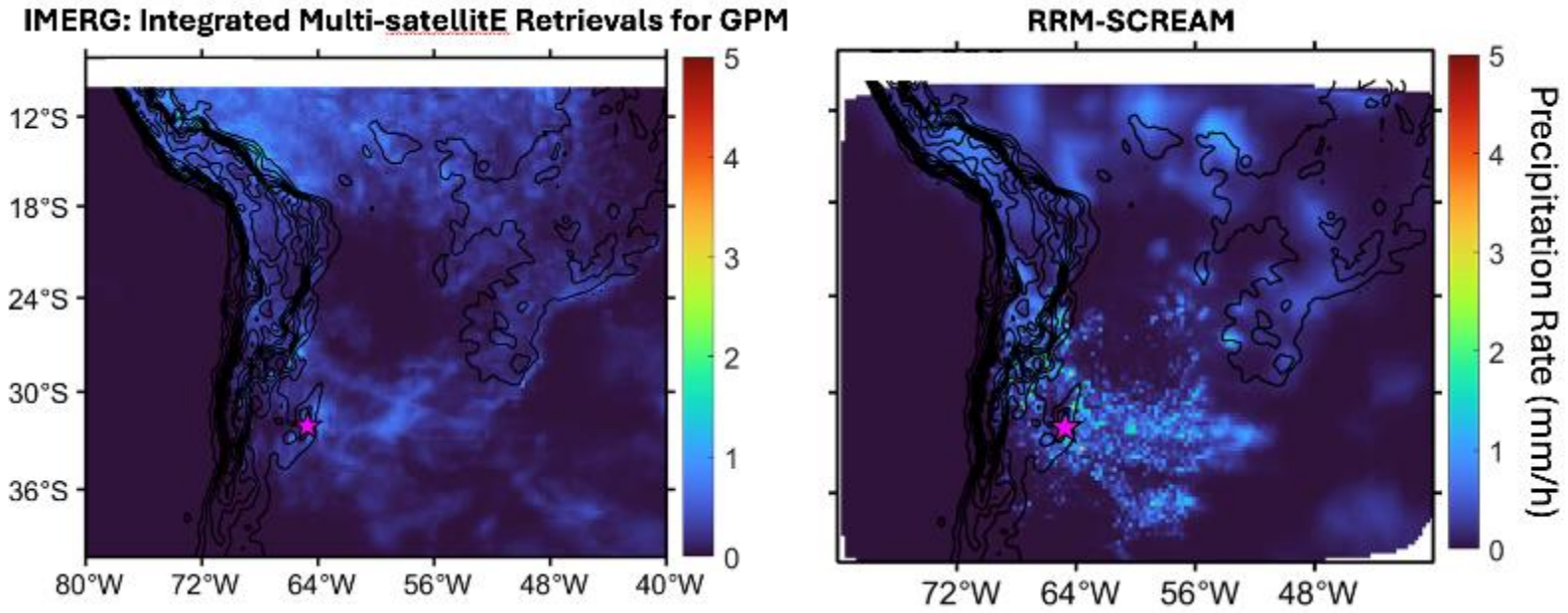

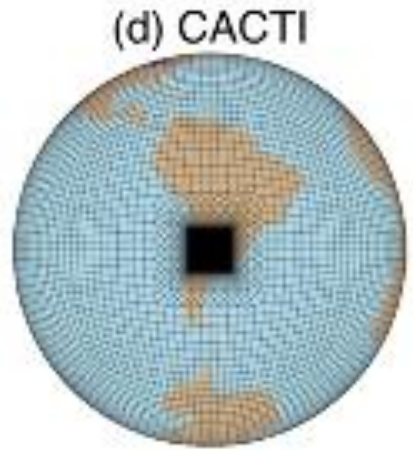

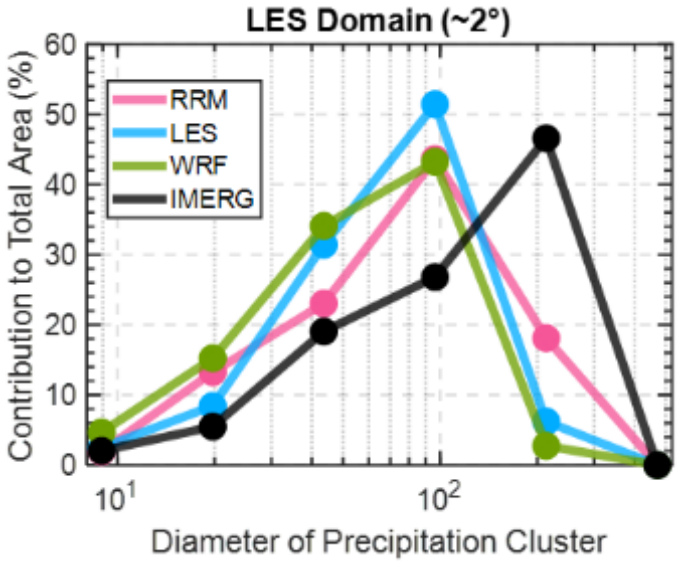

LASSO Case Library

2019-01-22	Two intense systems develop next to each other
2019-01-23	An intense, organized system is formed from multi-cell interactions
2019-01-25	Monster mesoscale convective system
2019-01-29	An intense case like January 22nd (12, E) that has similar CAPE but less shear
2019-02-08	Many convective initiations over and around the AMF

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Vertical Velocity

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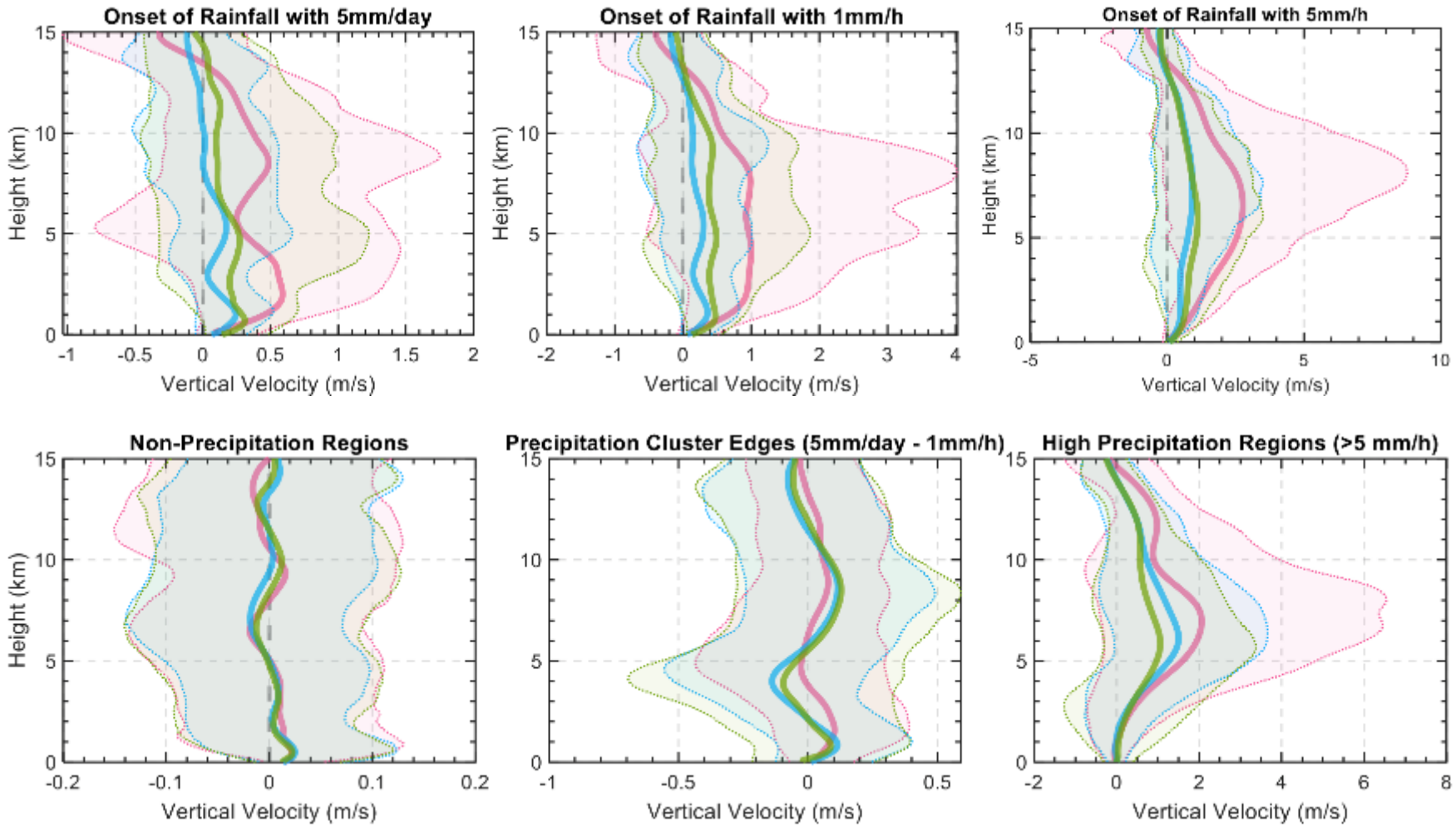
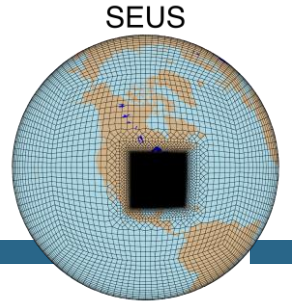


Local Case (02/08)

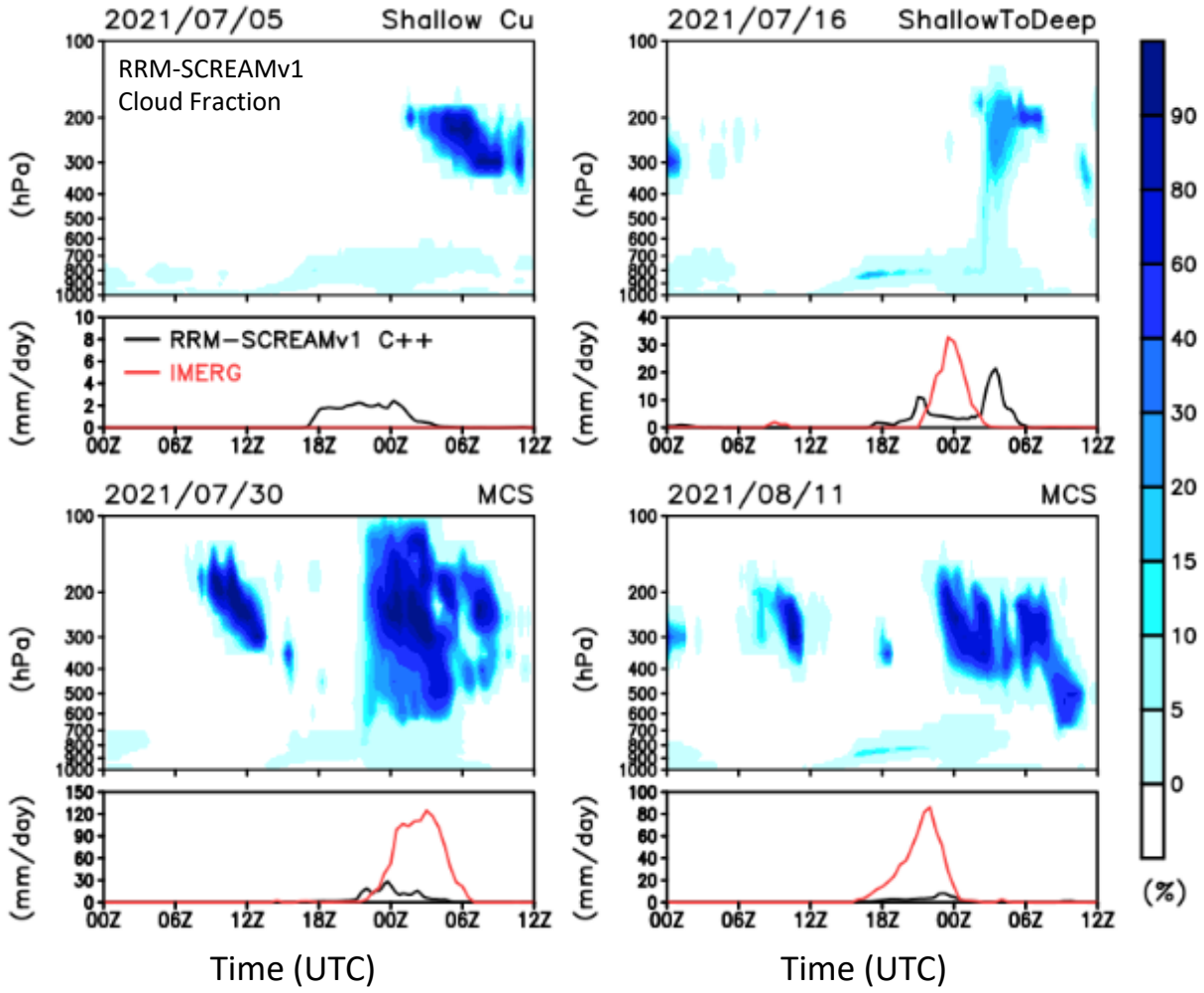
RRM
LES
WRF

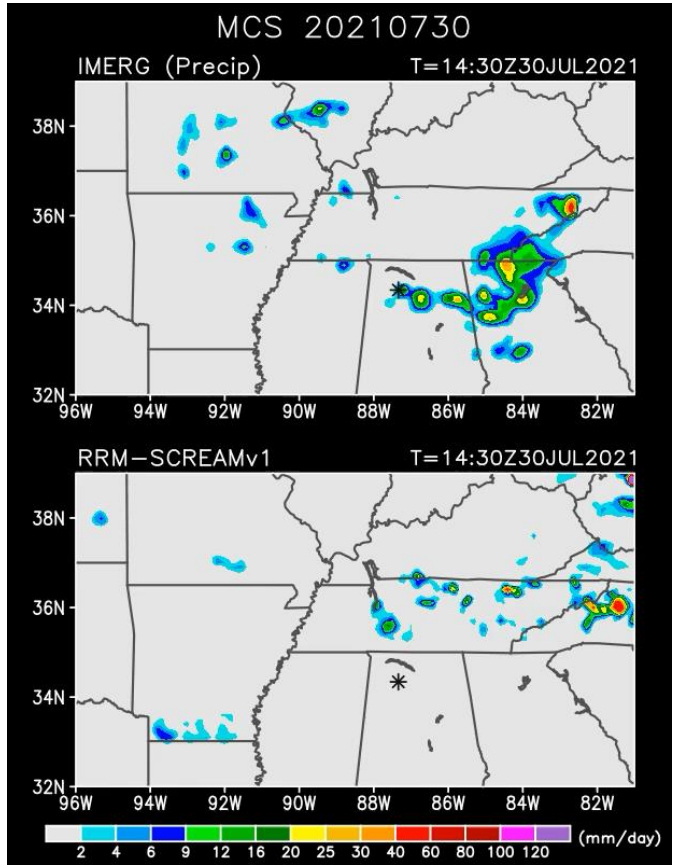
For each grid point of 0.1°, rain event is defined with daily maximum rain rate > 10mm/hour

THREAD's RRM-SCREAMv1 (C++) for SEUS



- Four selected convective regime cases over BNF AMF3 main site





∗ BNF AMF3 main site

LASSO BNF simulations will be very useful especially for SCREAM evaluation!