Study of Deep Convection with Presence of Overshooting Tops During RELAMPAGO Campaign

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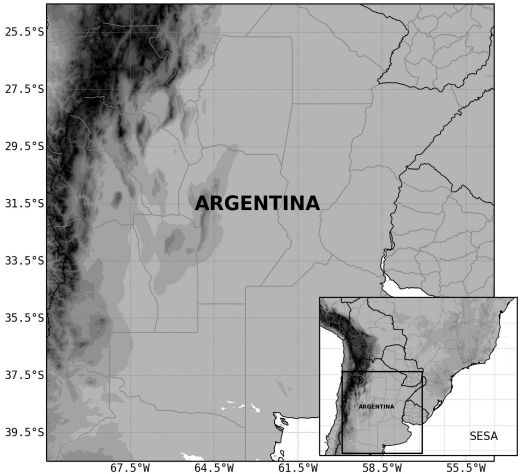
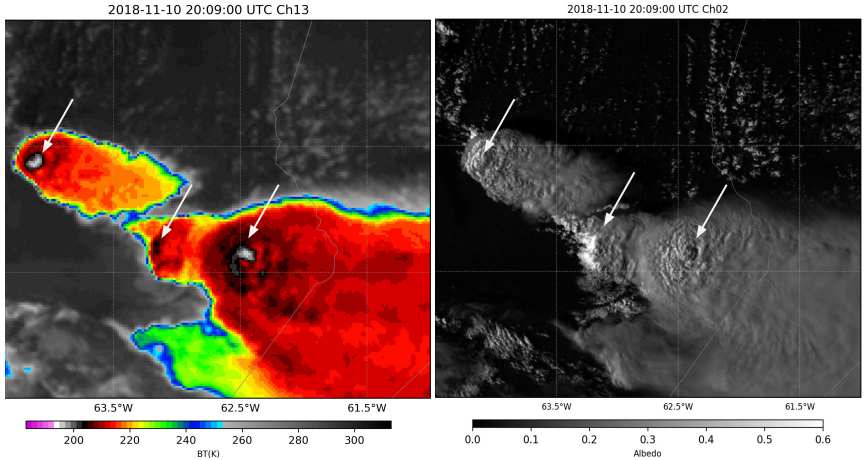
Background

- Thunderstorms in southeastern South America (SESA) often reach extreme intensity, duration, and vertical extension.
- The RELAMPAGO-CACTI field campaign was conducted to study the storms in this region.
- Overshooting tops (OTs) are defined as a ‘domelike’ protrusion above a cumulonimbus anvil.



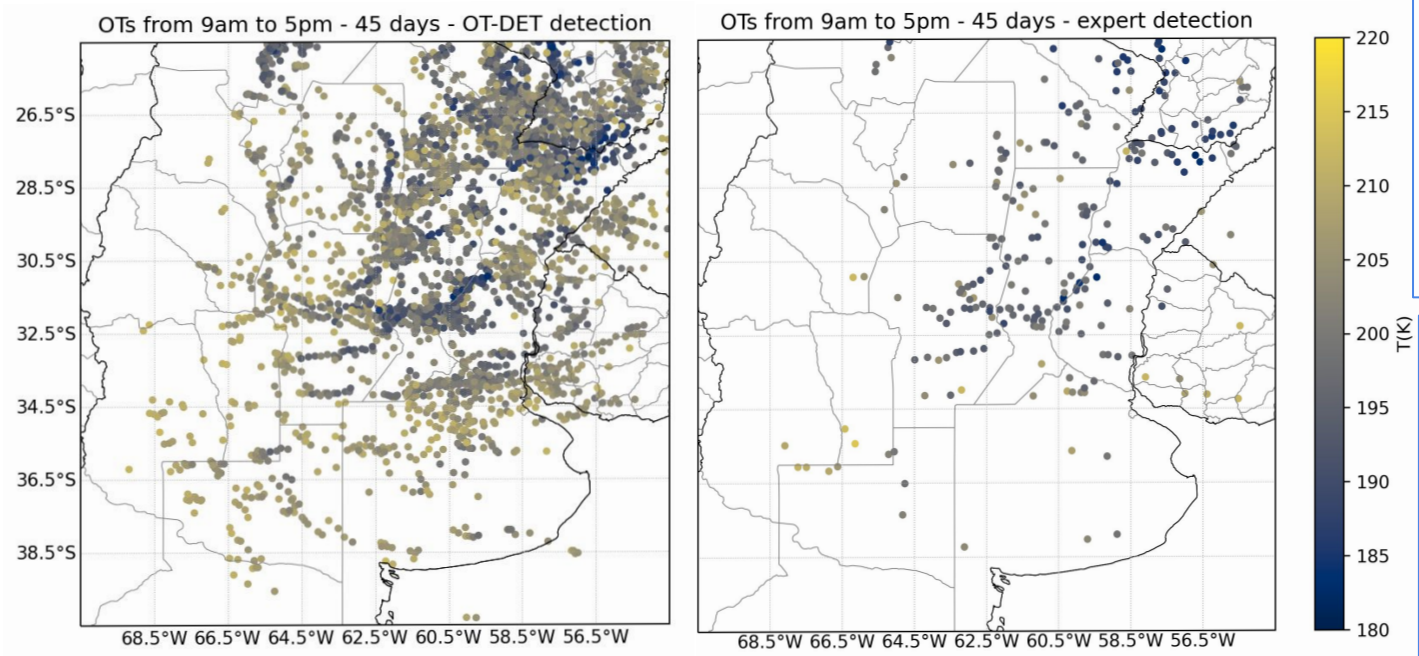
Area of interest

- An OT analysis is presented using an automated OT detection algorithm (OT-DET) based on GOES-16 data IR from October 2018 to March 2019.



OT-DET Validation

OT-DET algorithm is validated against a database generated through an expert detection of OTs using GOES-16 visible and IR images.



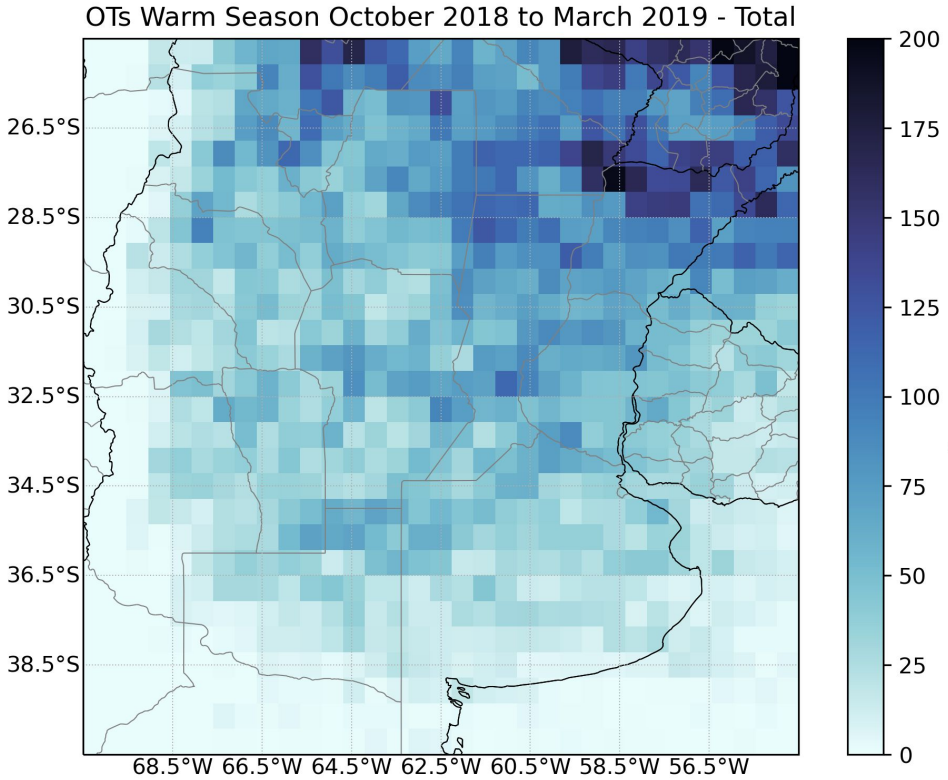
Daytime (9am to 5pm LT) - 01 November to 15 December 2018

Detected OT = 243
Non-detected OT = 33
False Alarms = 3187

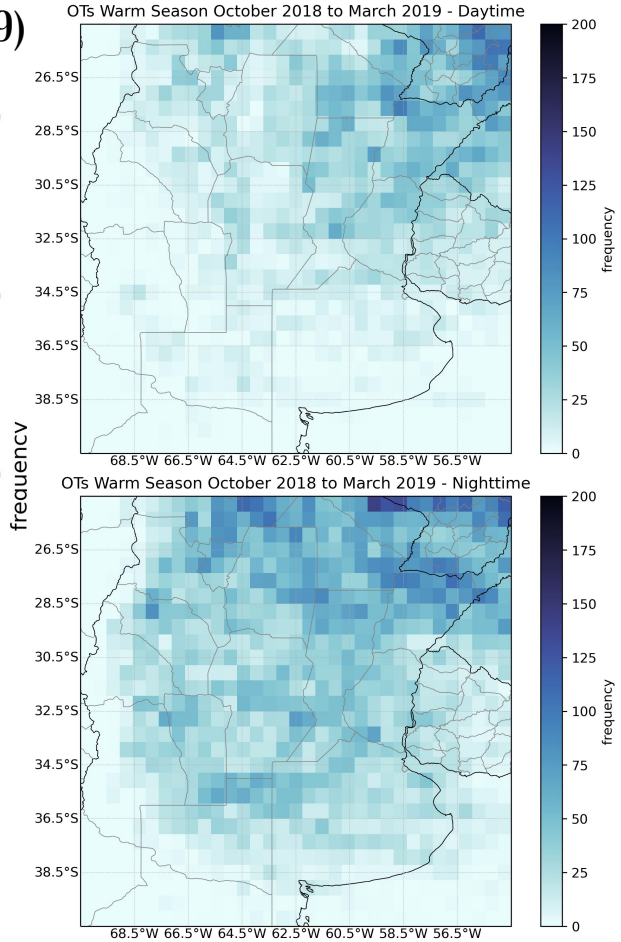
Although false alarms are high, hits and surprises are good results, since the number of surprises is low.

Possible strict criteria of the expert to indicate OTs is analyzed. Lack of expert detection at noon: the angle of the Sun does not cast a shadow.

OT-DET detection during Warm Season (2018 - 2019)



Total

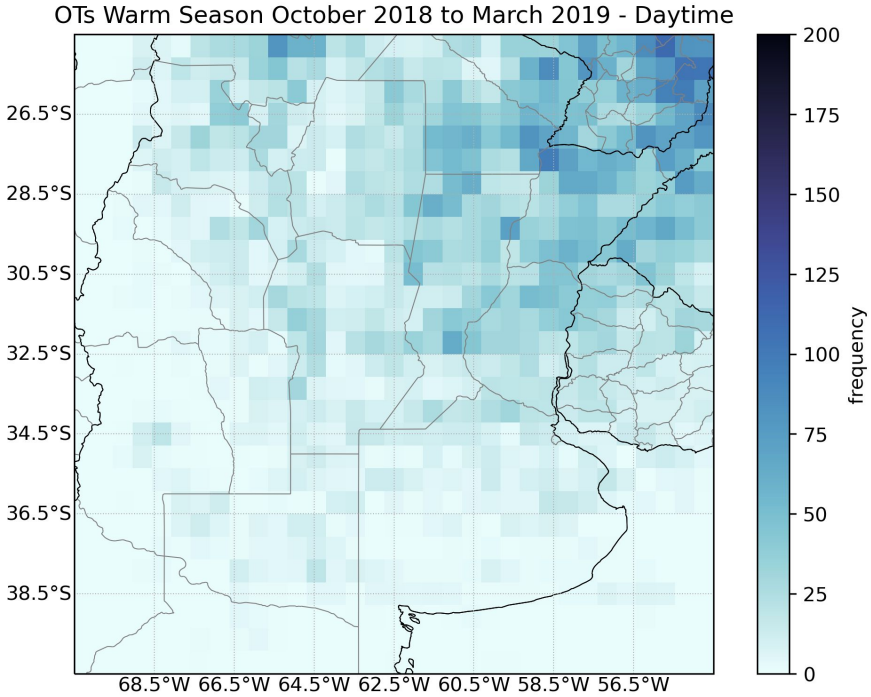


Daytime
Highest occurrence in the northeast during the day

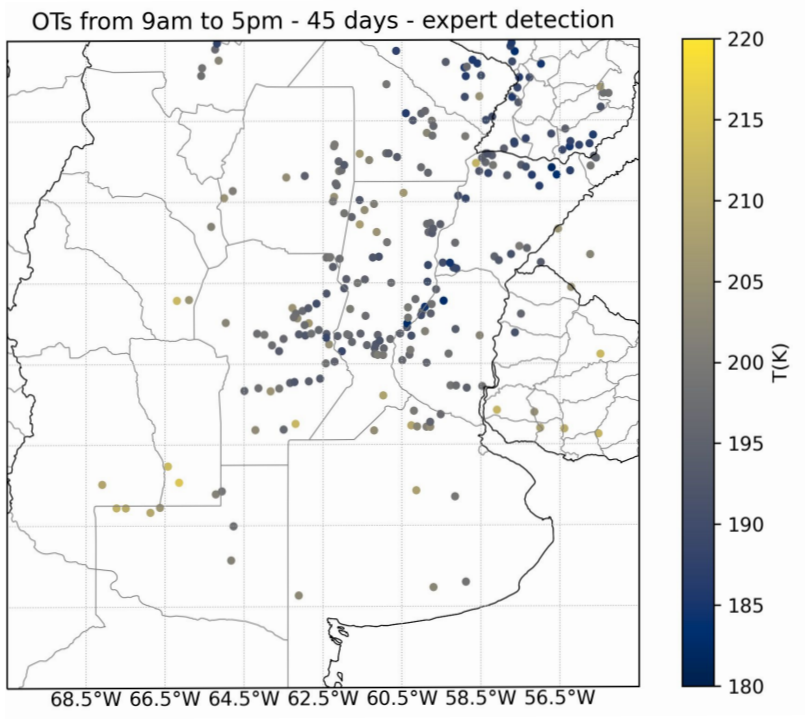
Nighttime
New detections arise in the center and west, maximum continues in the north

Daytime: 9am to 5pm.
Nighttime: 5pm to 8am.

The spatial distribution of OTs detected with OT-DET resembles the spatial distribution of OTs detected based on expert analysis.



OT-DET detection during Warm Season



Expert detection - 45 days

Questions?

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