

Pyroaerosols and mesocyclone development

Introduction:

Wildfires release large quantities of aerosol particles, including smoke, soot, and organic compounds, into the atmosphere. These pyroaerosol plumes can significantly alter the microphysical and thermodynamic environment of convective storms. By increasing the number of cloud condensation nuclei, aerosols from wildfires can delay precipitation, intensify updrafts, and potentially influence the development and intensity of rotating thunderstorms known as mesocyclones. Understanding how wildfire smoke interacts with severe weather systems is essential for improving storm prediction, especially in regions increasingly affected by both wildfires and extreme convective events.

Research topic

How do pyroaerosol plumes influence the intensity and structure of mesocyclones in convective storms?

Working plan

Step 1: Literature review, case selection and data collection

Step 3: Simulation of cases studies using ICON-ART

Step 3: Analysis of the results, writing of thesis

Requirements

Motivation, self-organization and team work

Programming: Python (basic), shell & unix (basic)



<https://phys.org/news/2017-12-nasa-airborne-science-team-surveys.html>