



Calhoun: The NPS Institutional Archive
DSpace Repository

Faculty and Researchers

Faculty and Researchers' Publications

2003-02-13

Tropical cyclones in vertical shear: An
idealized study of TS Chantal (2001) during
the CAMEX-4 field campaign

Ritchie, Elizabeth; Elsberry, R.L.; Molinari, J.

<http://hdl.handle.net/10945/49718>

This publication is a work of the U.S. Government as defined in Title 17, United States Code, Section 101. Copyright protection is not available for this work in the United States.

Downloaded from NPS Archive: Calhoun



Calhoun is the Naval Postgraduate School's public access digital repository for research materials and institutional publications created by the NPS community. Calhoun is named for Professor of Mathematics Guy K. Calhoun, NPS's first appointed -- and published -- scholarly author.

Dudley Knox Library / Naval Postgraduate School
411 Dyer Road / 1 University Circle
Monterey, California USA 93943

<http://www.nps.edu/library>

[The Simpson Symposium](#)

P5.3

Tropical cyclones in vertical shear: An idealized study of TS Chantal (2001) during the CAMEX-4 field campaign

Elizabeth A. Ritchie, University of New Mexico (UNM), Albuquerque, NM; and R. L. Elsberry and J. Molinari

Recent observational and idealized modeling studies of tropical cyclones (TC) in environmental vertical wind shear have shown that the storms tend to have strong and persistent wave number one asymmetries, particularly in the rainfall and vertical velocity fields. The asymmetries in the tropical cyclone structure that develop under the influence of westerly wind shear have been shown to be significantly greater compared with those that develop under similar easterly shear strength. The intensity of the tropical cyclone is similarly impacted, with a TC in westerly shear being significantly weakened compared with a TC in easterly shear of the same magnitude.

Tropical storm Chantal (2001) developed in strong and persistent westerly shear during the NASA CAMEX-4 field campaign in conjunction with the Hurricane Landfall (HL 2001) experiment. Whereas the storm struggled to develop throughout its lifetime, periods of strengthening and weakening can be directly related to the amount of vertical wind shear present in the environment. Using idealized model simulations that resemble the environment sampled by the NASA DC-8, ER-2 and NOAA P3 aircraft during Chantal's struggle for survival, the relationships among the environmental vertical wind shear and the tropical cyclone wind and precipitation structure, and specifically the tropical cyclone intensity, will be examined.

[Poster Session 5, Tropical Cyclones: Intensity and Structure](#)

Thursday, 13 February 2003, 9:00 AM-11:00 AM

[Previous paper](#) [Next paper](#)

[Browse or search entire meeting](#)

[AMS Home Page](#)