The evolution and role of ageostrophy in the 3–5 February 1998 Ice Storm

1. Abstract
    A. Powerful wind (25 m s^{-1}) and rain event (80 mm) for New Jersey, Virginia, and North Carolina coasts
    B. Inland Maryland and Pennsylvania ice storm with 50–80-mm sleet
    C. Cyclogenesis associated with shortwave in northern stream phasing with southern stream trough
    D. Rapid deepening caused isallobaric component of wind to advect cold surface air south, under strong warm air advection at 850 hPa, leading to ice storm

2. Introduction
    A. Meteorological overview of event
        1. Slow deepening and erratic track of low along Gulf Coast
        2. Intercepted by shortwave with negative tilt and rapidly deepened
        3. Interacted with coastal front
    B. Societal impacts
        1. Sustained winds of 15 m s^{-1} and gusts to 25 m s^{-1} along Carolina coastline
        2. 70–80-mm rain in Virginia and North Carolina
        3. Extended period of sleet/freezing rain in Appalachians

3. Data and methodology
    A. National Centers for Environmental Prediction (NCEP) ETA gridded analyses
        1. 1200 UTC 2 February to 1200 UTC 5 February
        2. Grid spacing of dataset
        3. GEMPAK format
        4. Standard 250 (jet), 500 (vorticity), and 850-hPa (temperature) maps; cross sections
    B. Surface DIFAX charts archived locally
    C. METARs archived locally

4. Results
    A. Synoptic pattern and evolution
        1. 250-hPa heights and isotachs
            a. Split jet pattern
            b. Strong subtropical jet common to El Niño years
        2. 500-hPa heights, vorticity, and vorticity advection
            a. Surface low weak and erratic until shortwave intercepts
            b. Provides necessary positive vorticity advection for height falls and rising motion
        3. 850-hPa heights, temperatures, and temperature advection
            a. Stalled baroclinic zone along Gulf Coast
            b. Inverted trough and coastal front along Mid-Atlantic
    B. Mid-Atlantic ice storm
        1. Potential temperature and wind cross-sections
            a. Cold air damming
            b. Ageostrophy of the flow with "back of the envelope" calculation

2. Surface charts
    a. Introduction of surface cold air different from usual damming events = No cold anticyclone over the Northeast
    b. Rapid deepening and isallobaric flow advected cold air south

5. Summary and conclusions
    A. Ice storms associated with cold air damming along Atlantic coastline
    B. Same thing here, but not from cold anticyclone, rather from strong cold air advection due to unbalanced flow
    C. Unbalanced flow because of rapid deepening of low due to phasing of southern and northern stream troughs

6. Acknowledgements
    A. Eyad Atallah
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7. References
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