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POTENTIAL VORTICITY STRUCTURES IN EXTRATROPICAL CYCLONES AND THEIR RELATIONSHIP TO FORECAST EVOLUTION AND SURFACE WINDS

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en salle de conférences Joël Noilhan

Résumé :

Extratropical cyclones are classically described in terms of their air flows (conceptualised as conveyor belts), fronts and cloud patterns. Potential vorticity (PV) provides a complementary, dynamically-relevant, picture of cyclone structure and development. Here extratropical cyclones will be presented from a PV perspective starting from dry idealised cyclones and progressing quickly to the modification of those PV structures by diabatic processes within cyclones, and impacts of those diabatic modifications on both the cyclone itself and downstream forecast evolution. Strong surface winds and gusts are a major hazard of extratropical cyclones. A broad region of strong winds has long been characteristically associated with the warm conveyor belt. By contrast the causes of, and interplay between, cold sector strong wind jets (including sting jets) is active research area. Advances in our understanding of these topics over the past decade will be presented and open questions raised.