



Idealised simulations of sting jet cyclones

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Extratropical cyclones often produce strong surface winds, mostly associated with low-level jets along the warm and cold fronts. Some severe extratropical cyclones have been found to produce an additional area of localised strong, and potentially very damaging, surface winds during a certain part of their development. These strong winds are associated with air that originates within the cloud head, exiting at the tip of the cloud head and descending rapidly from there to the surface. This rapidly descending air associated with the strong surface winds is known as a sting jet.

Previous published work on sting jets has been limited to analyses of only a small number of case studies of observed sting jet cyclones, so a study of idealised sting jet cyclones, rather than specific cases, will be useful in determining the important features and mechanisms that lead to sting jets. This work focuses on an idealised simulation of a cyclone with a sting jet using a periodic channel configuration of the idealised nonhydrostatic Met Office Unified Model. The idealised cyclone simulation is based on baroclinic lifecycle simulations run at sufficiently high resolution for a sting jet to be generated.

An analysis of the idealised cyclone and a comparison of the idealised cyclone with case studies of observed sting jet cyclones will be presented.