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Umwandlung tropischer Wirbelstürmen in außertropische Tiefdruckgebiete während der THORPEX Pacific Asian Regional Campaign (T-PARC) in 2008

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Predicting the extratropical transition of tropical cyclones (ET) poses a considerable challenge for numerical weather forecast systems as the interaction between the tropical cyclone and the midlatitude flow covers a large range of scales from the convective inner-core of a tropical cyclone to the synoptic-to-planetary-scale Rossby waves. Reduced midlatitude predictability may be associated with the direct impact of an ET event, if the ex-tropical cyclone is predicted to reach a continent as an extratropical storm. Arguably the larger impact on predictability, however, occurs due to the excitation of a Rossby wave packet that can initiate explosive development downstream of the ET system itself. This may initiate extratropical cyclogenesis on the eastern side of an ocean basin, or modify existing flow patterns enhancing the risk of severe precipitation events. Due to its influence on the downstream flow, an ET event can lead to significantly reduced predictability over an entire ocean basin. Thus investigating the downstream impact of ET was one of the main objectives of the THORPEX-Pacific Asian Regional Campaign (T-PARC).

During the field phase of T-PARC, several tropical disturbances moved poleward to undergo a transition into the midlatitudes. The character of these disturbances included a weak circulation associated with widespread deep convection, a midget tropical cyclone, a typhoon, and a super typhoon. Corresponding to the variety of tropical disturbances was a wide range of forecast and actual structural changes and downstream developments. In this presentation highlights of the ET cases are described, including the observations collected, the spectrum of structural changes and their impacts on the downstream flow.