



Wave transfer across multiple wave-guides

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Synoptic-scale Rossby waves propagating along the extra-tropical and subtropical wave-guides are ubiquitous features of the tropopause level flow. They are a key meteorological feature closely associated with surface baroclinic development and energy propagation in the atmosphere. From a potential vorticity (PV) perspective the waves exist and propagate along the bands of maximum PV gradients at the dynamical tropopause breaks.

We investigate the transfer of wave-energy from one wave-guide onto another from a dynamical view-point. There are indications from previous statistical studies, that over a climatological time span this inter wave-guide wave transfer is of particular importance at the end of the north Atlantic wave-guide, where wave-energy can be transferred from the extra-tropical onto the subtropical wave-guide.

Here a special focus is set on the role that breaking waves play within this transfer. The breaking of the waves on one hand demarks the end of the wave-propagation along one wave-guide and on the other hand it seems to be crucial for the transfer of wave-action from one wave-guide onto another. This issue is of potential interest for the forecast of the propagation of synoptic scale waves. The transfer of wave energy from the extra-tropics into the subtropics and into the polar region is exemplarily discussed for two cases.