

## **SESSION: (A1) Mechanisms of S2S predictability**

**(A1-09)**

### **The impact of Northern Hemisphere mid-latitude variability on tropical teleconnections**

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The role of Northern Hemisphere mid-latitude variability on atmospheric rivers (AR) with landfall on the west coast of the U.S. is evaluated in two sets of ensemble re-forecasts for the winter 2014/2015. The first set of re-forecasts defines the control experiment. In the second set of re-forecasts the variability of the Northern Hemisphere mid-latitudes is relaxed to the climatological mean state of the model. The AR events occurring in observations during this winter are first divided based on the moisture source location and trajectory, which ultimately determines the landfall location. During this winter, in observations all AR events primarily originate in the tropics, whereas the re-forecasts show some events with moisture descending from the extra-tropics. Secondly, the re-forecasts of these category of events are compared between the control experiment and the experiment with smoothed mid-latitude variability. By removing the synoptic scale variability of winds, temperature and moisture, the West Pacific trough becomes anchored and starts to deepen at 40 N after one week. The probability of occurrence of AR with tropical origin increases at all lead times up to four weeks, whereas the probability of occurrence of extra-tropical events decreases. After two weeks, AR events with moisture ascending from the tropics tend to become more persistent and zonally-oriented and by weeks 3-4 they can extend across the whole Pacific basin.