The Impacts of the Diurnal Land-Sea Breeze Variation on the Diurnal Precipitation Cycle over an Idealized Tropical Island

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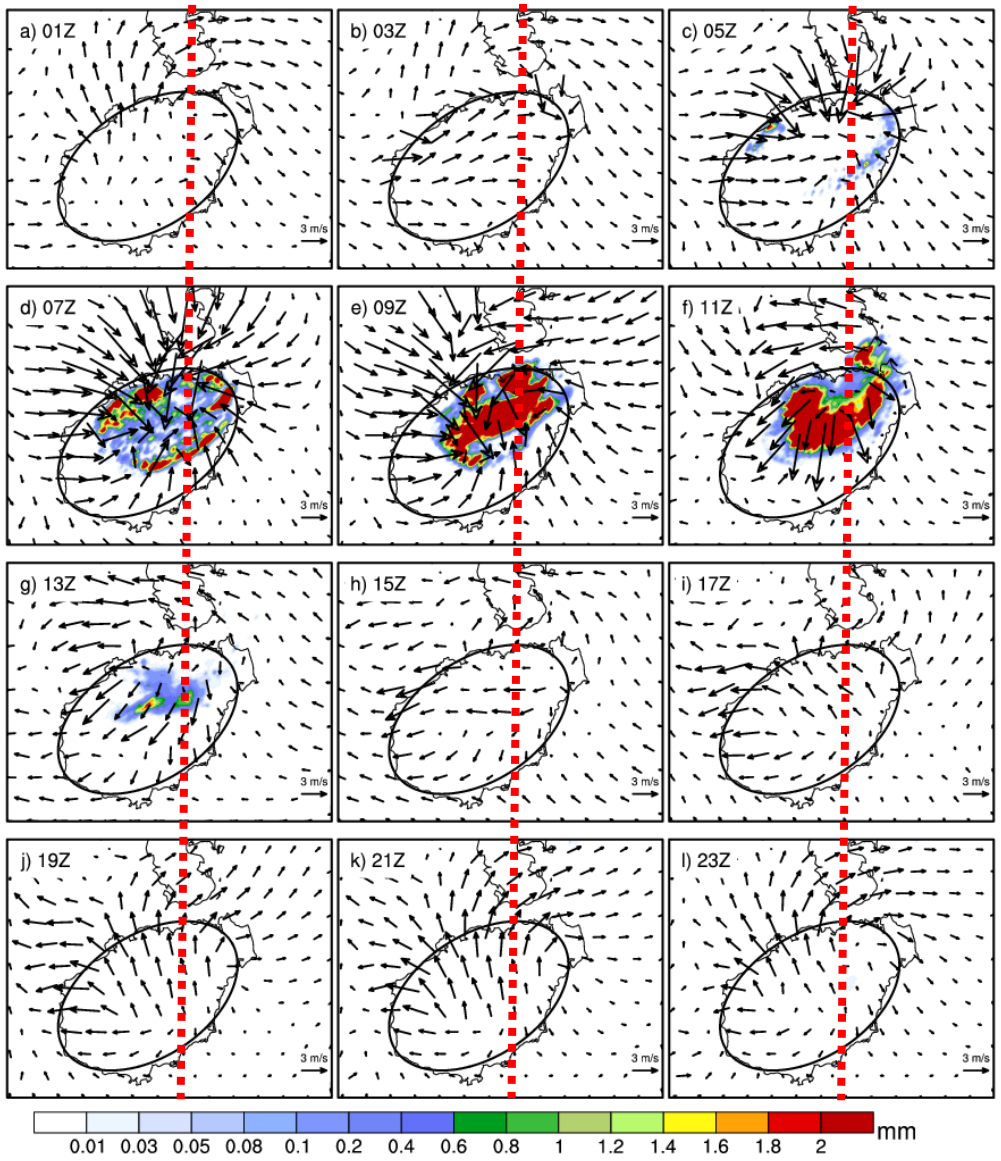
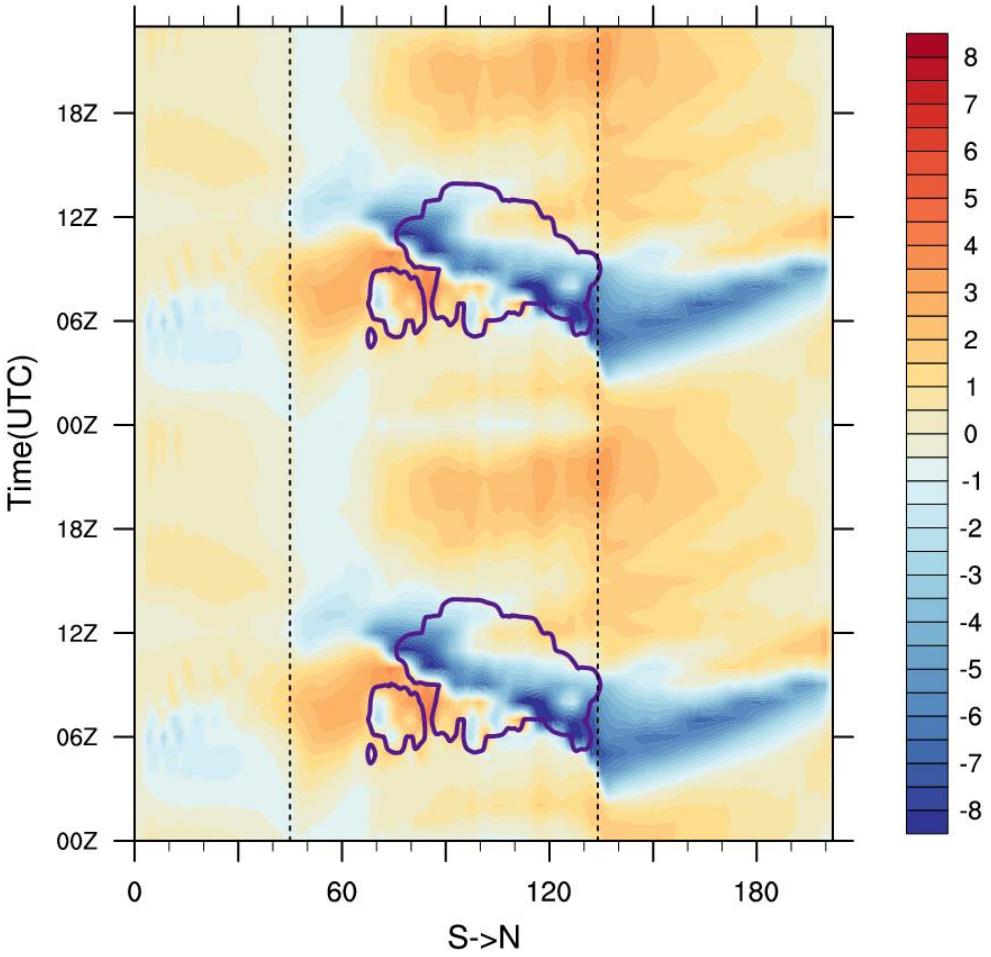
Group meeting, 12th Dec, 2016

Diurnal precipitation cycle and Variation of perturbation wind

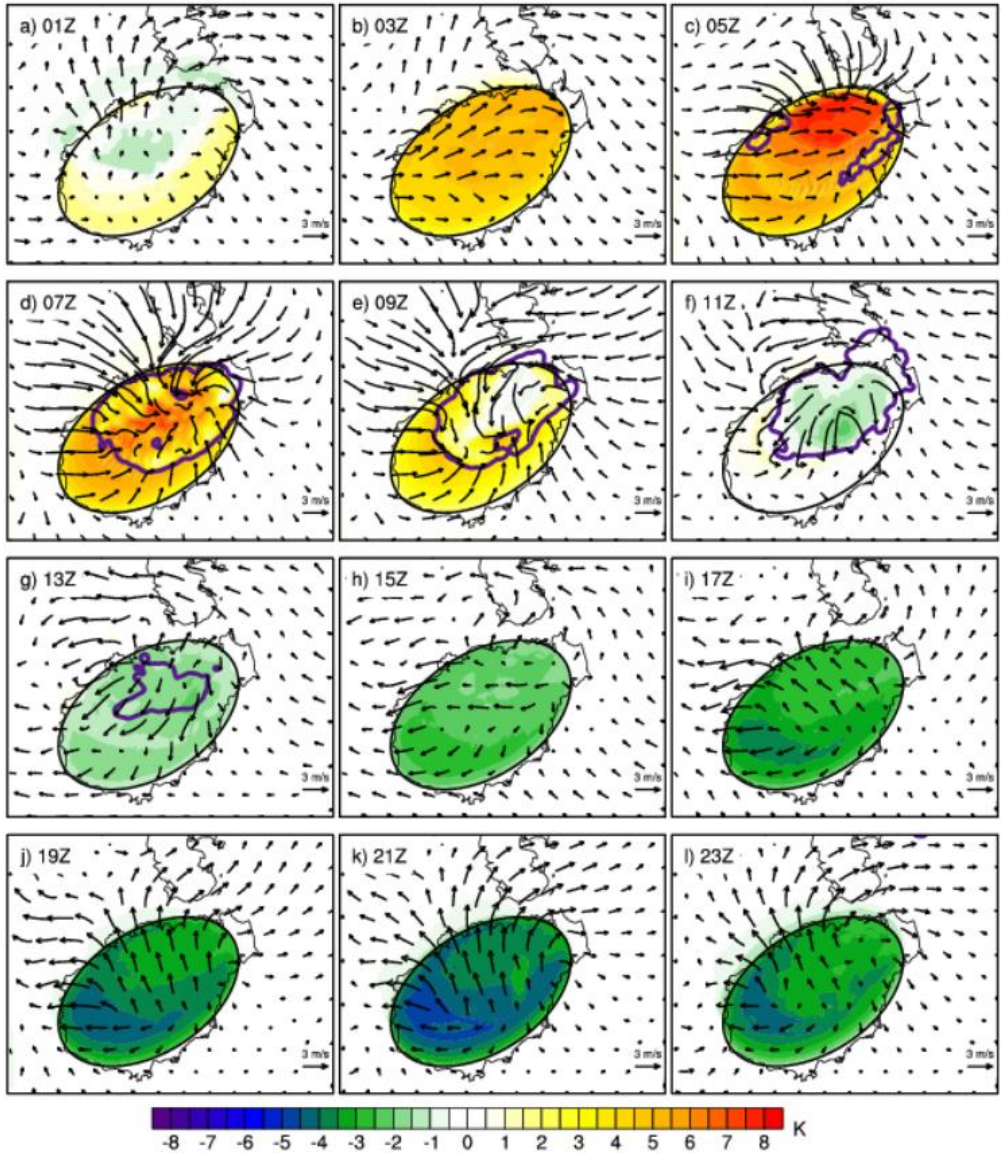


Hourly accumulated precipitation and 2nd lowest perturbation horizontal wind

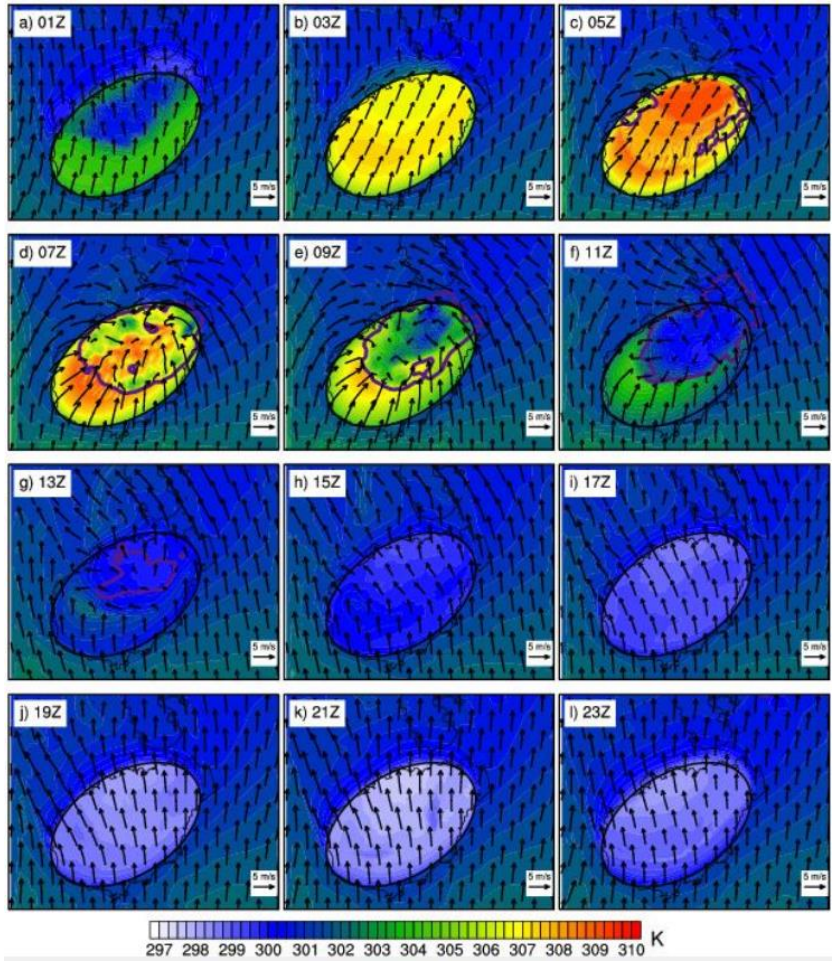


The evolution of precipitation and perturbation wind

Variation of 2-m perturbation temperature and 2-m temperature



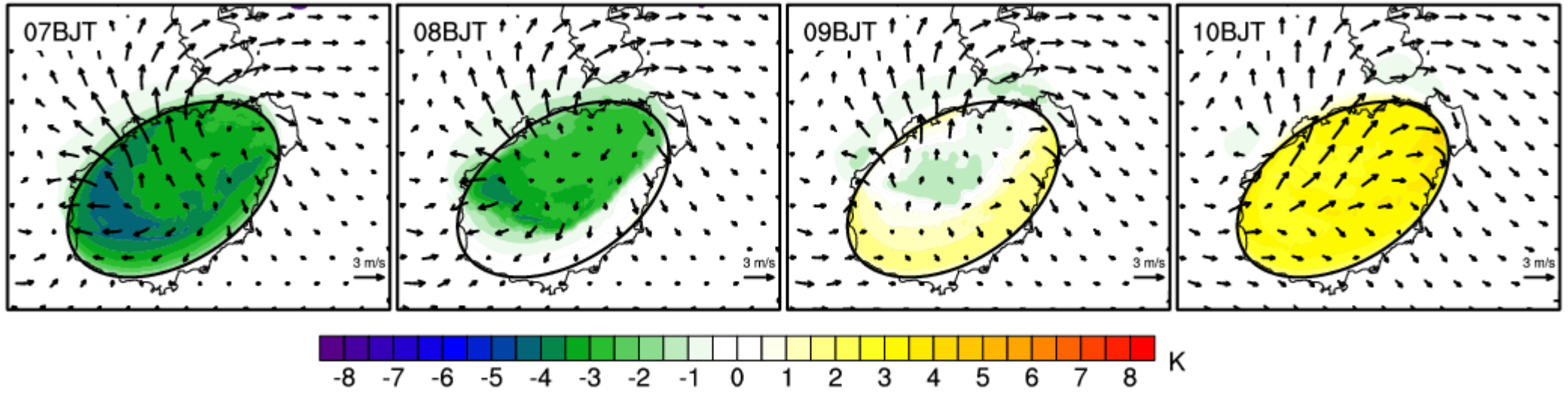
2-m perturbation T and 2nd lowest perturbation horizontal wind



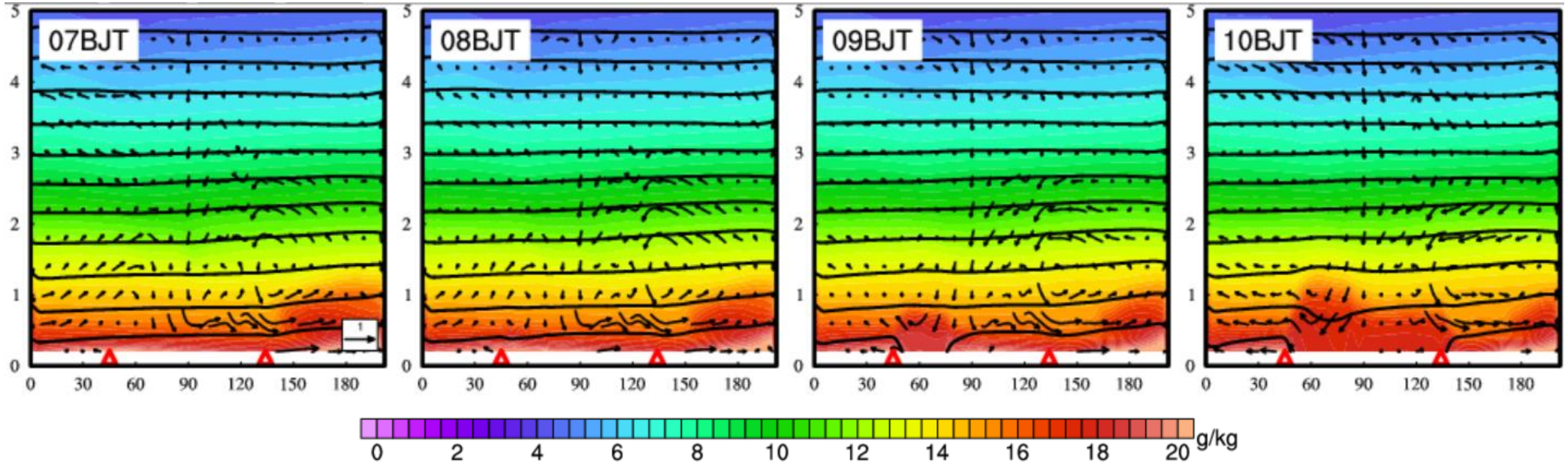
2-m T and 2nd lowest horizontal wind

Stage 1: Land breeze weankening

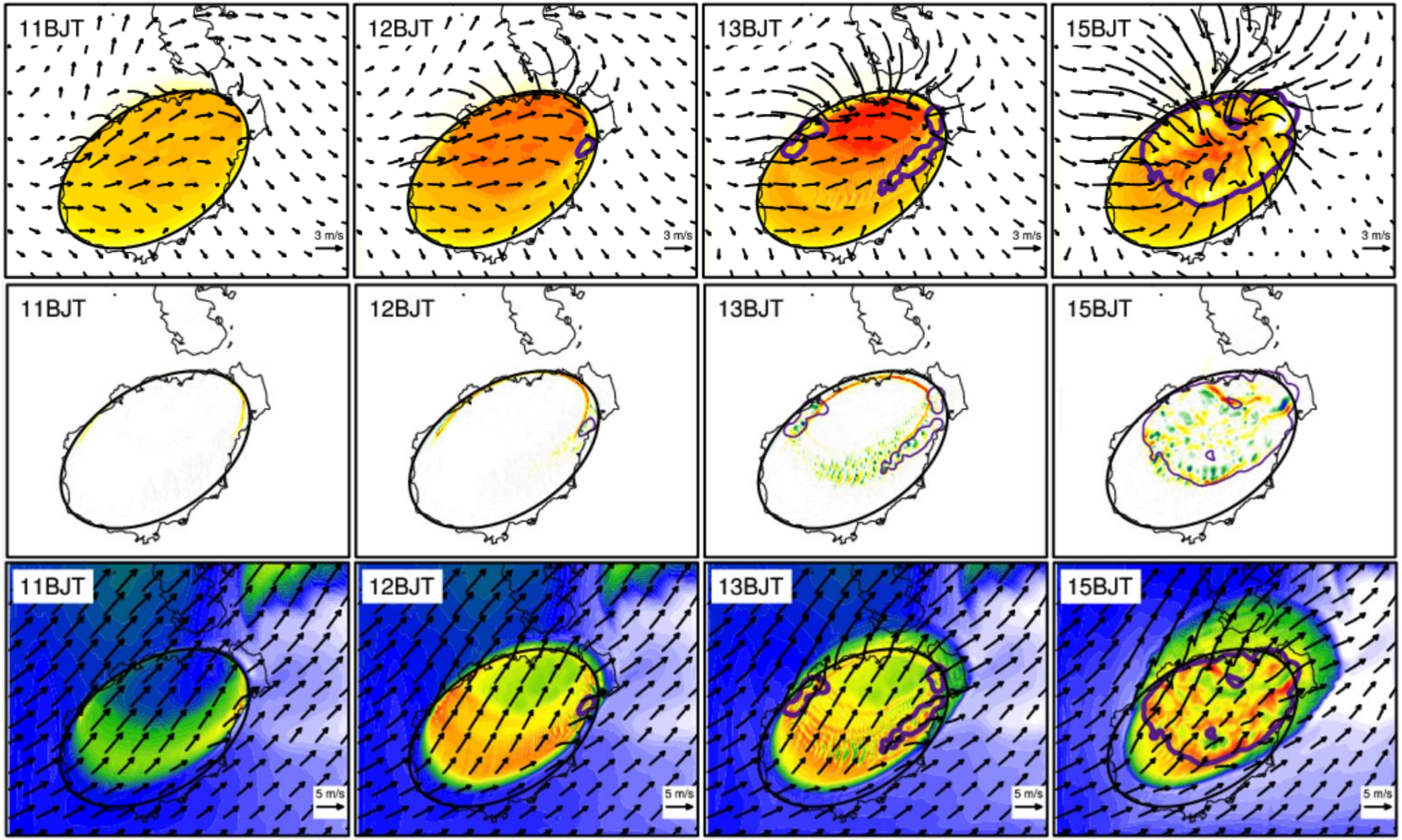
2-m pert-T



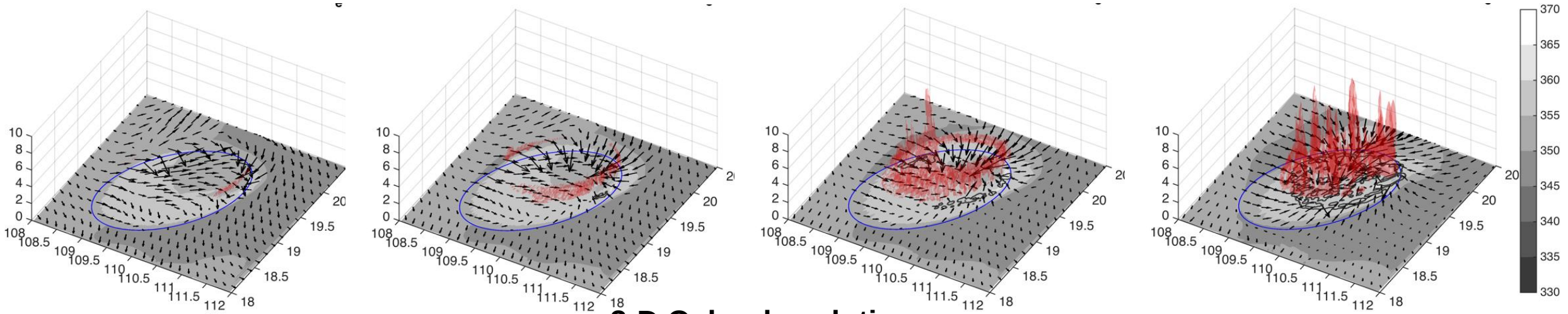
Qvapor



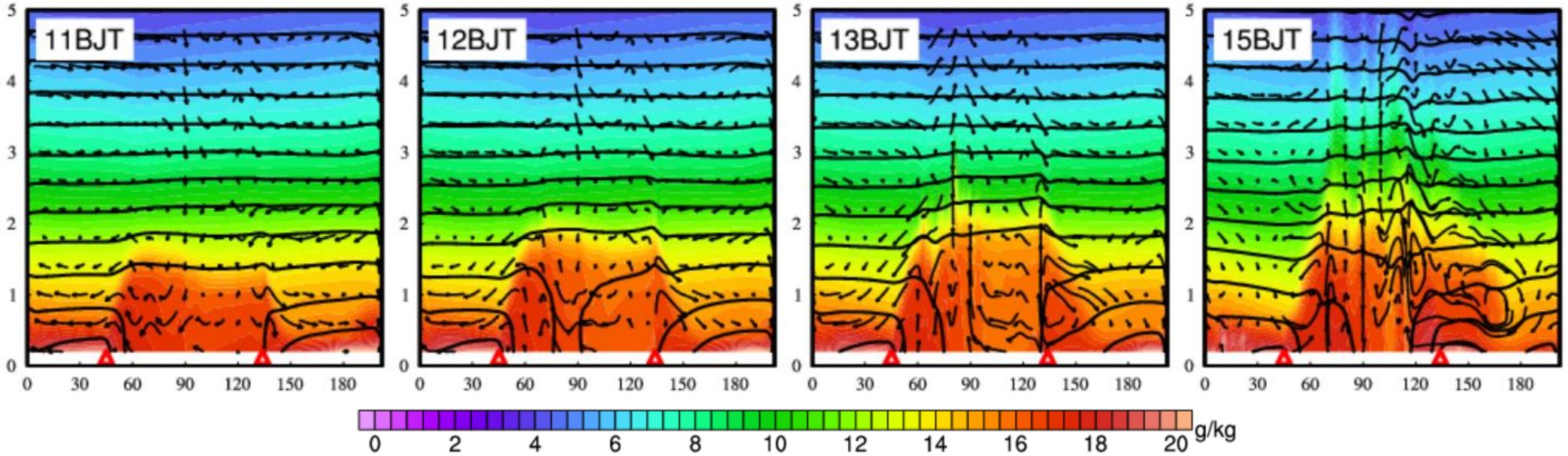
Stage 2: genesis and development of Sea breeze



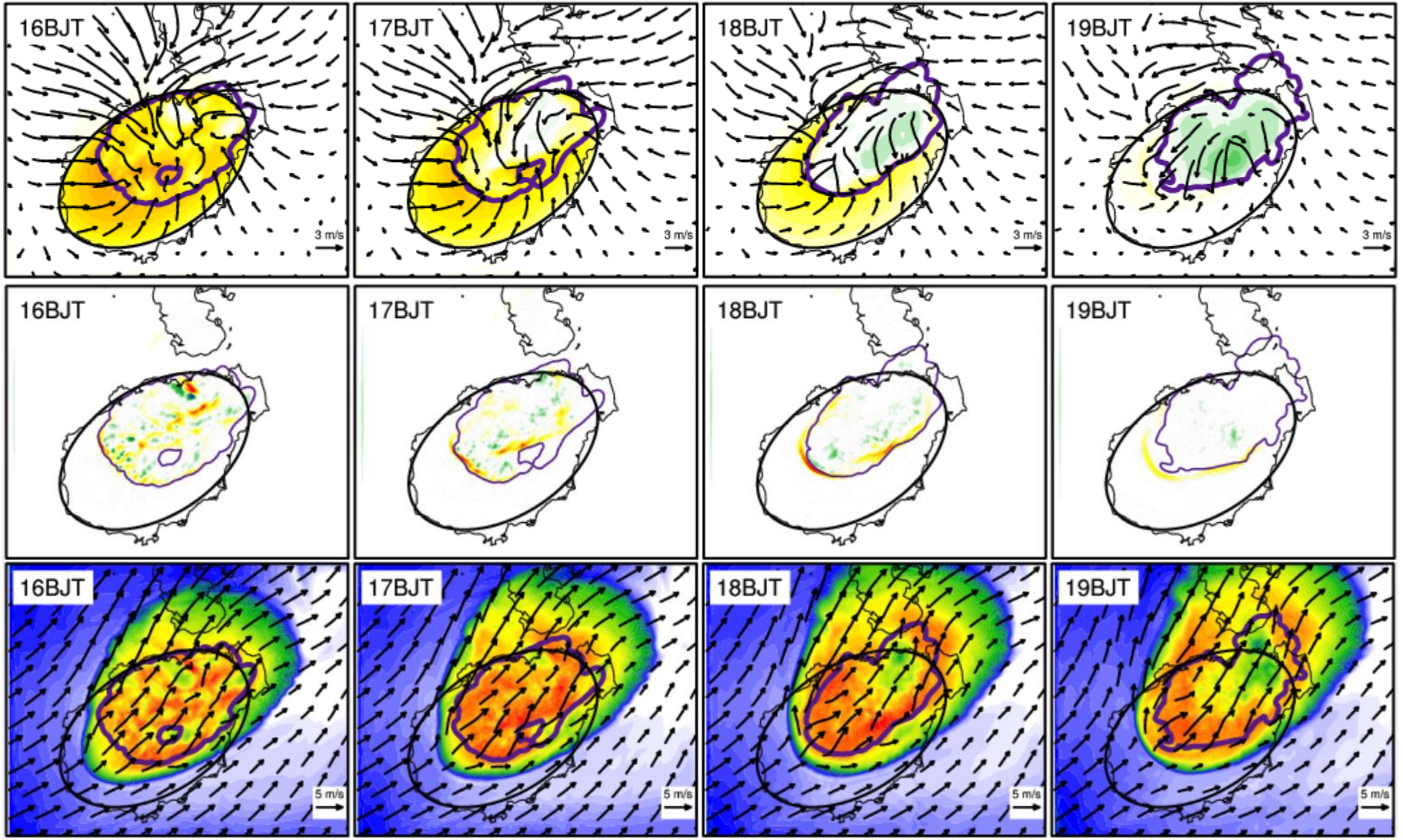
Stage 2: genesis and development of Sea breeze



3-D Qcloud evolution

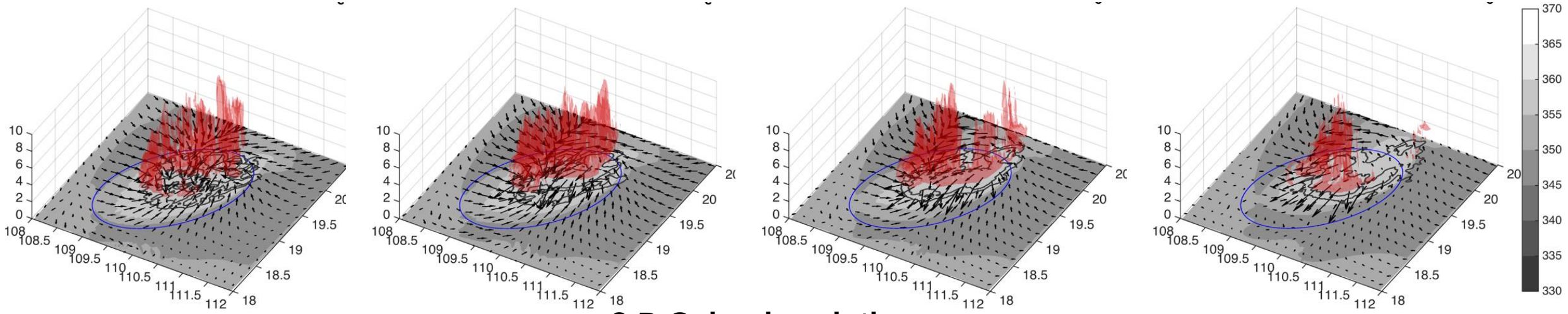


Stage 3: Sea breeze weakening

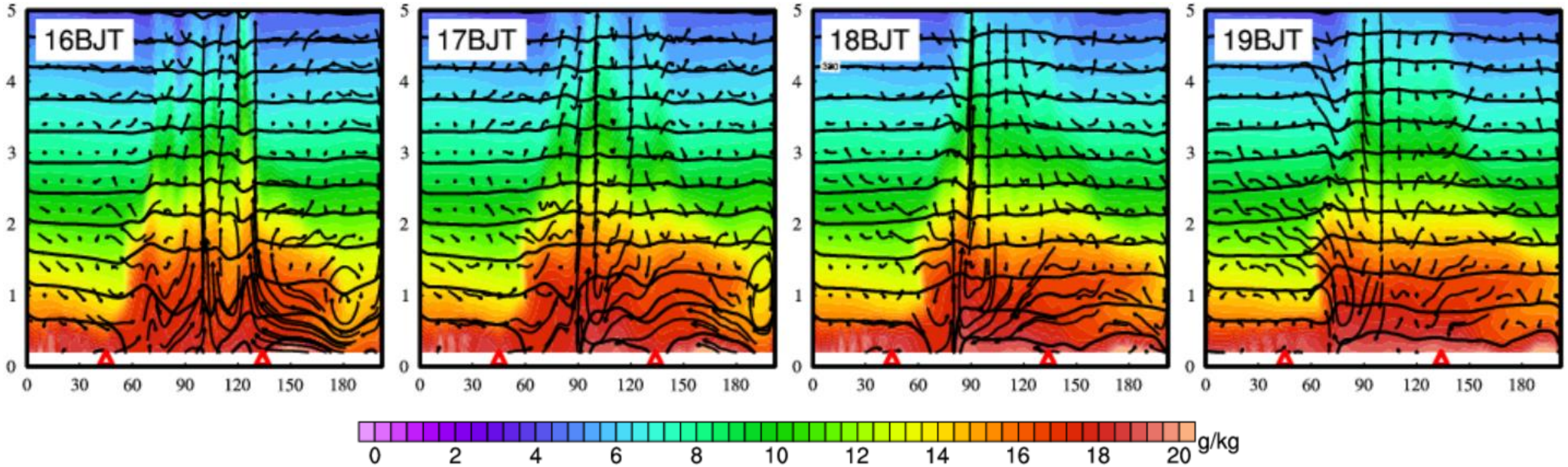


Stage 3: Sea breeze weakening

16BJT 17BJT 18BJT 19BJT

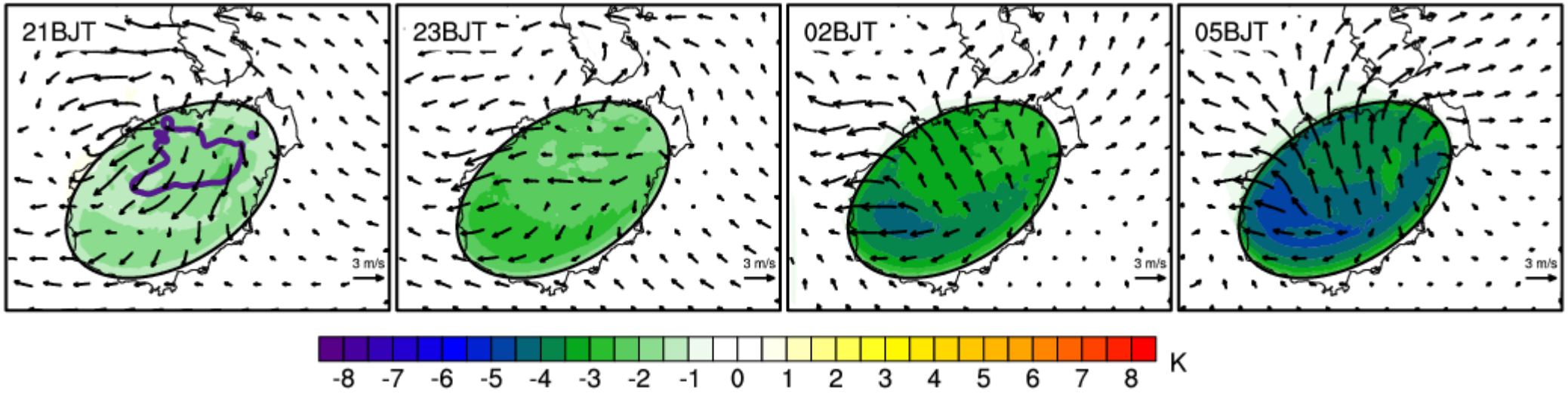


3-D Qcloud evolution

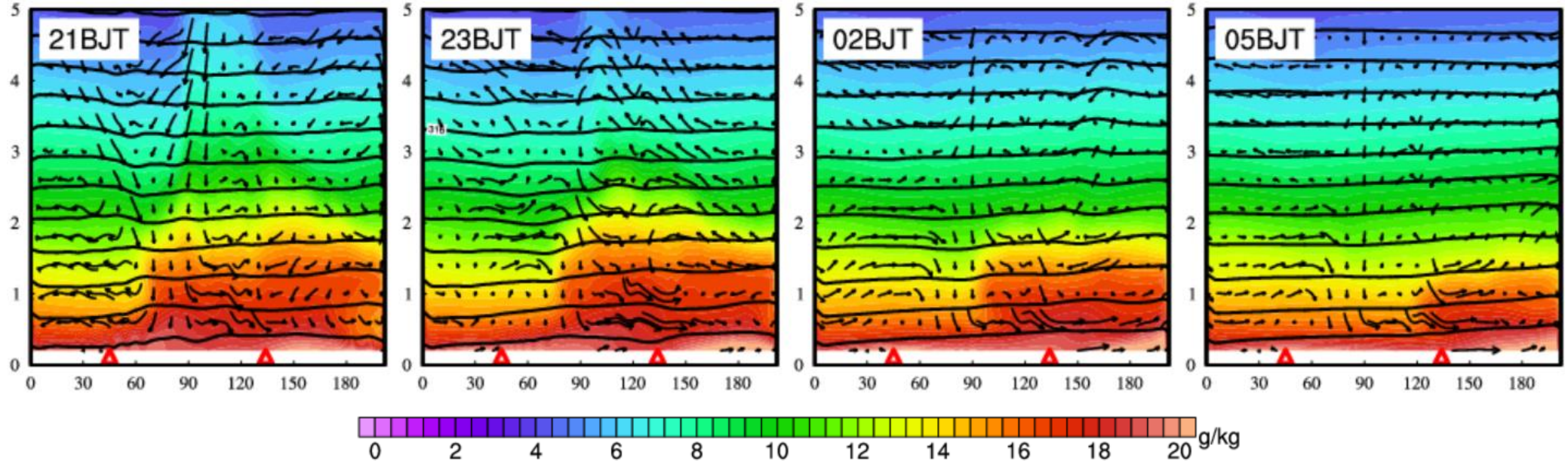


Stage 4: genesis and development of Land breeze

2-m pert-T

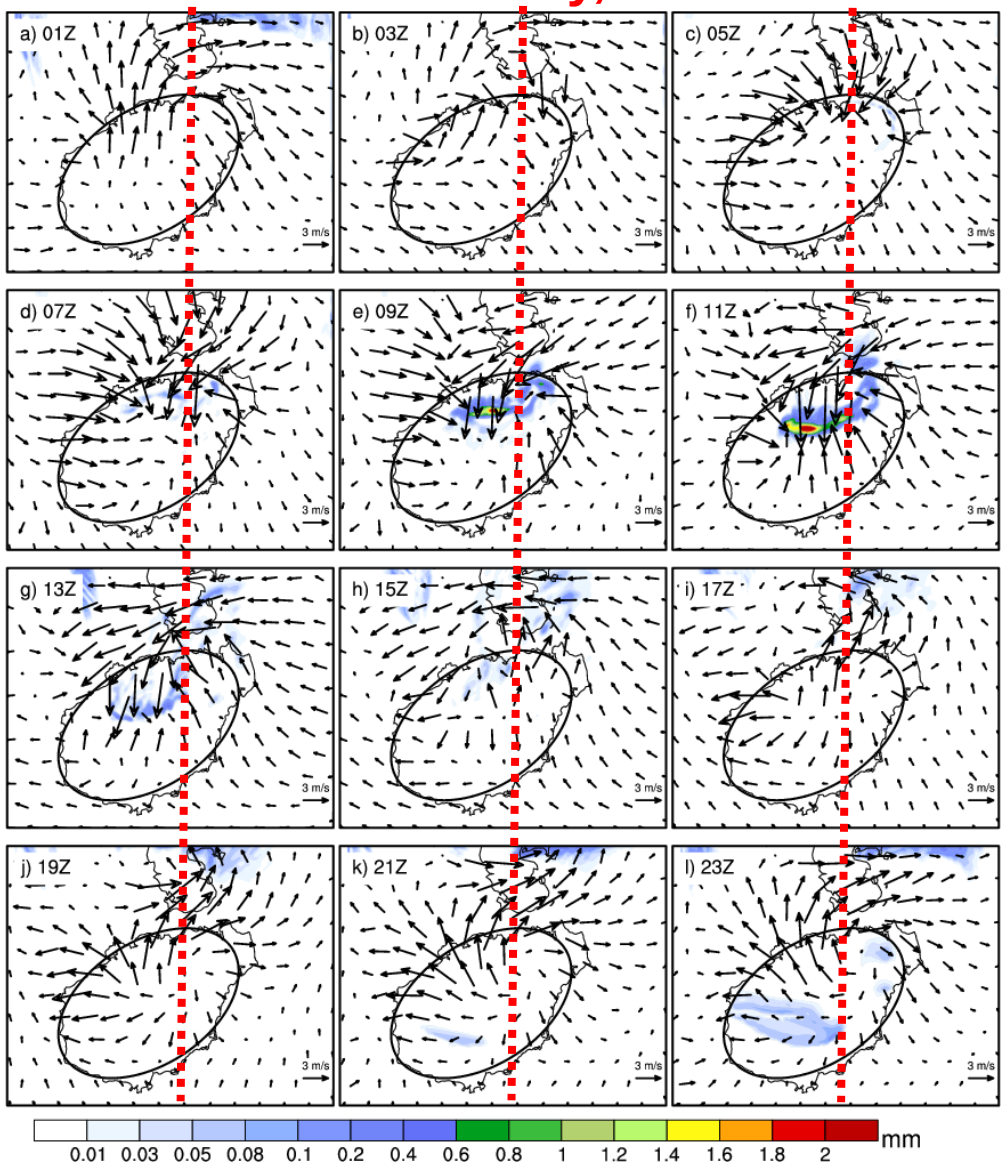


Qvapor

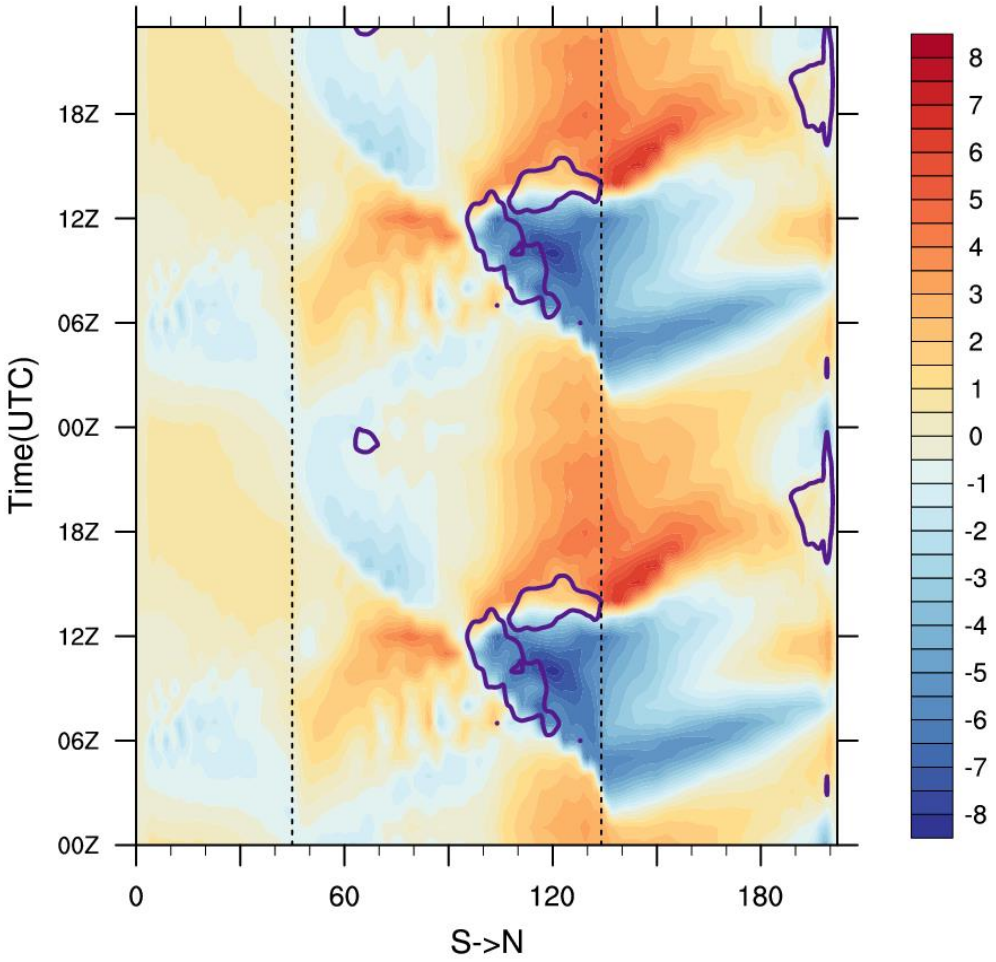


Diurnal precipitation cycle and Variation of perturbation wind

Fakedry, turned off Latent heating and cooling



Hourly accumulated precipitation and 2nd lowest perturbation horizontal wind



The evolution of precipitation and perturbation wind

Summary

1. **Diurnal precipitation cycle is consistent with the convergence and divergence of the land-sea breeze over the island.**

2. **The late afternoon precipitation is the result of the sea breeze front in coordination with the moisture transportation from the ocean.**

3. **Latent heating plays significant role on the convection initiation and precipitation intensity over the island.**

4. **Cold pool is an important factor for the propagation of the sea breeze.**