

Séminaire ven 5 Nov 2010 11h / Seminar Fri Nov 5th 2010 11h

Conférencier/Lecturer: Professor Seok-Woo Son
(McGill University, AOS dept.)

Sujet/Subject: Stratospheric influence on the Northern Hemisphere
Extratropical weather and climate systems:
the Sudden Stratospheric Warming (SSW) and
Quasi-Biennial Oscillation (QBO)

Présentation/Presentation: Anglais / English

Lieu/Room: Salle des vents (Dorval)

iweb: <http://web-mrb.cmc.ec.gc.ca/mrb/rpn/SEM/>
web: <http://collaboration.cmc.ec.gc.ca/science/rpn/SEM/index.php>

Résumé/Abstract

The quality of 5 reanalysis data (ERA, JRA-25, NASA-MERRA, NCEP/DOE and NCEP/NCAR) and CMC reanalysis is evaluated for a record-breaking SSW event in 2009 whose spatio-temporal structure is well observed by the COSMIC GPS RO measurements. Although non-negligible biases, locally up to 50 K in potential temperature at 10 hPa, are present, most reanalysis data reasonably well captured this. It is also found that the GEM-Strato successfully predicted this event. Somewhat surprisingly, forecast error at 10 hPa is even smaller than JRA-25. Composite analysis of SSW events during 1979-2009 from 5 reanalysis data further shows that all reanalysis data are reasonably good for examining stratospheric extreme events and their impact on the troposphere in an intraseasonal time scale.

The QBO-induced tropical-extratropical teleconnection and its impact on the Typhoon tracks during boreal summer are examined by using the ERA40, OLR and tropical cyclone track data. It is found that the QBO modulates convective activities over the western North Pacific by changing vertical wind shear in the upper troposphere. The resulting latent heating then influences extratropical circulations by exciting Rossby wave trains which modulate the Typhoon tracks over the western North Pacific and possibly temperature over the Canada. Capability of the GEM-Strato to simulate the QBO is also discussed.