Simulating Wind Channeling over Frobisher Bay with GEM-LAM 2.5 km

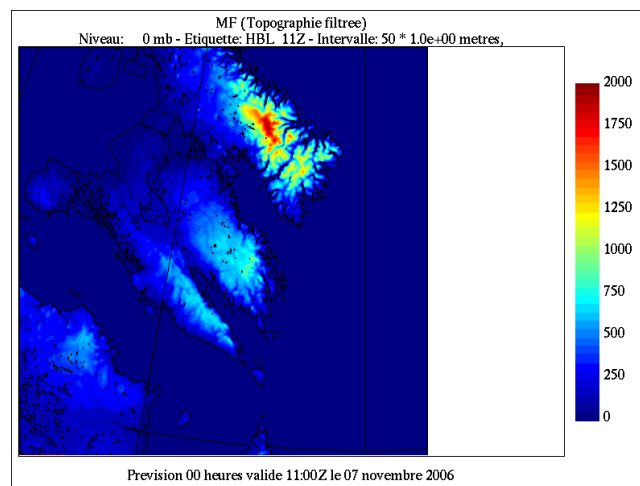Daniel Deacu[1,2], Ayrton Zadra[2] and John Hanesiak[1]

[1] University of Manitoba

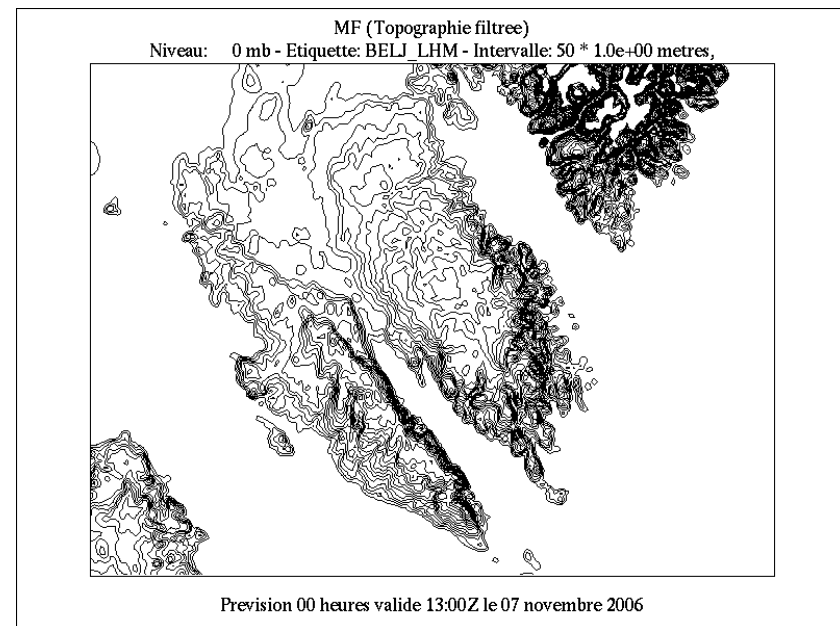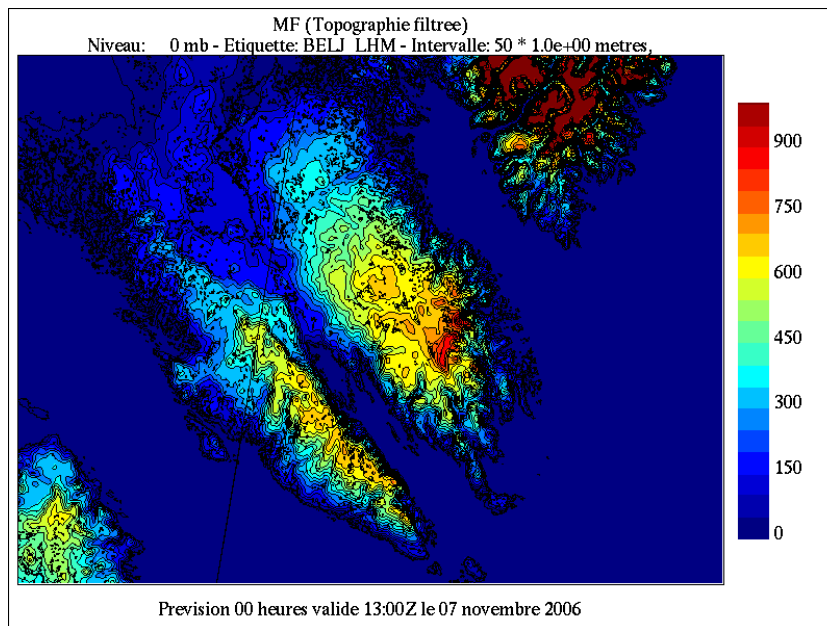[2] Recherche en Prévision Numérique, Environment Canada

November 3, 2008

Introduction

- Case study: Wind storm of Nov. 7-8, 2006

- Model: GEM-LAM

  - horizontal resolution: 2.5 km
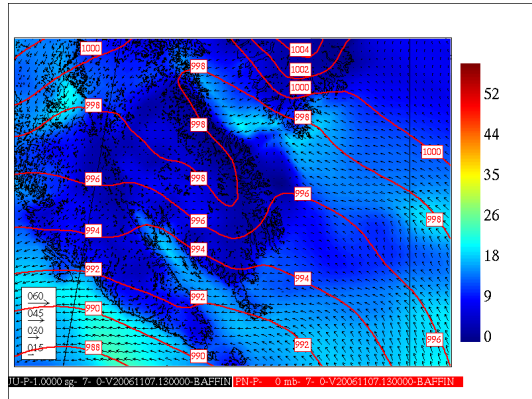 - initial and boundary conditions: GEM-REG
  - model domain and topography

MF (Topographie filtree)
Niveau: 0 mb - Etiquette: HBL 11Z - Intervalle: 50 * 1.0e+00 metres,

Prevision 00 heures valide 11:00Z le 07 novembre 2006

Topography of Southern Baffin Island
in GEM-LAM 2.5 km

1:

Sea Level Pressure and Surface Wind
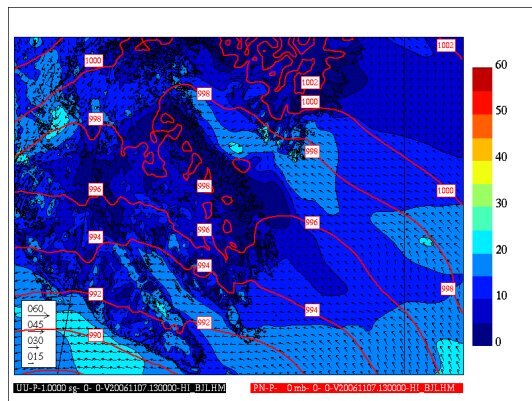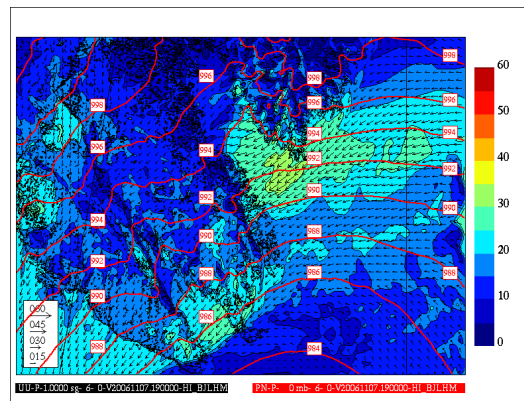# GEM-REG and GEM-LAM 2.5 (BELJ_LHM)

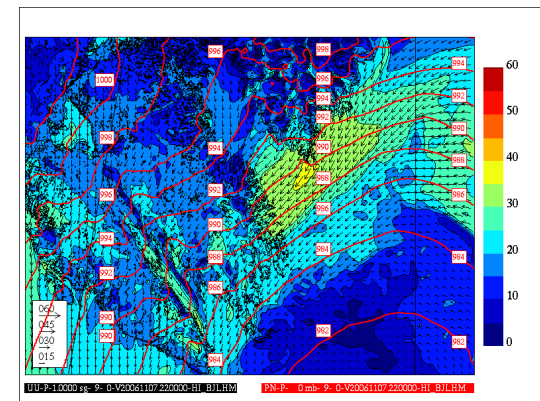(a) GEM-REG – 13 Z
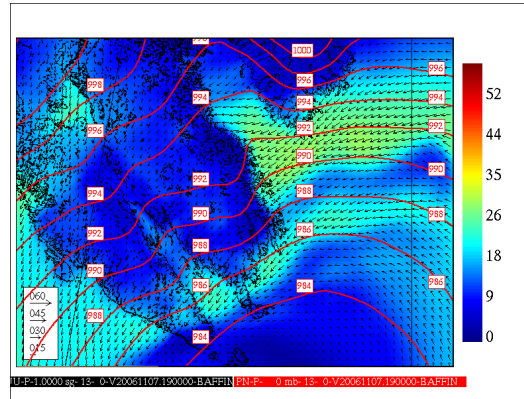
(b) GEM-REG – 19 Z
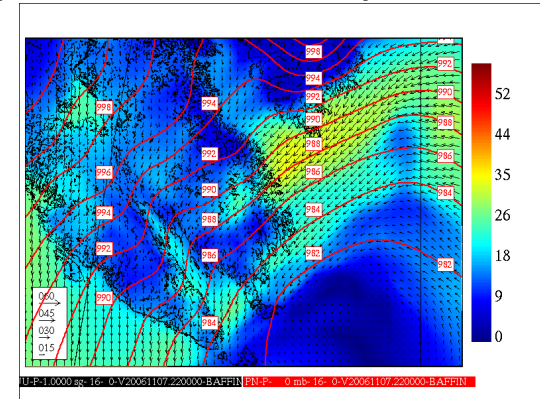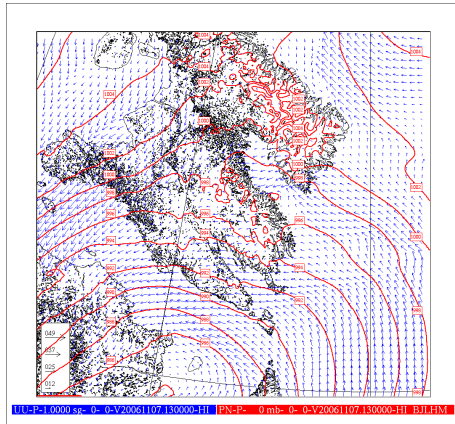
(c) GEM-REG – 22 Z

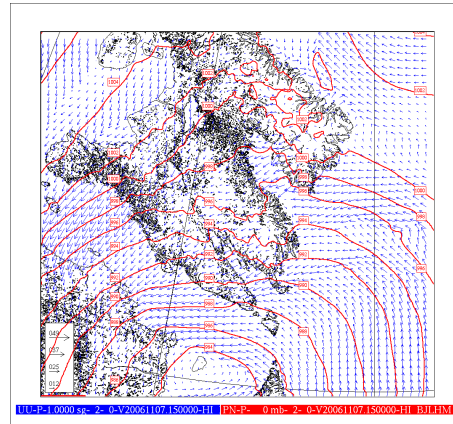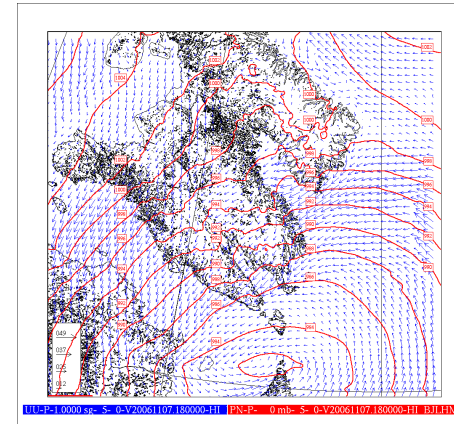(d) GEM-LAM 2.5 – 13 Z

(e) GEM-LAM 2.5 – 19 Z
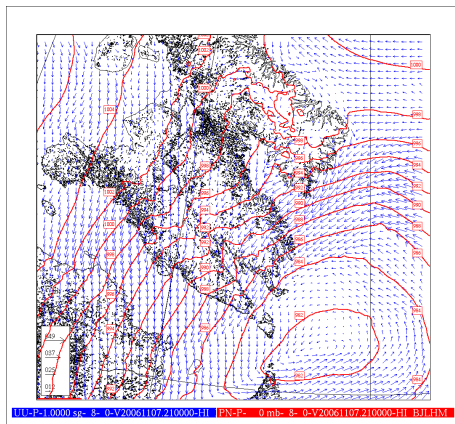
(f) GEM-LAM 2.5 – 22 Z
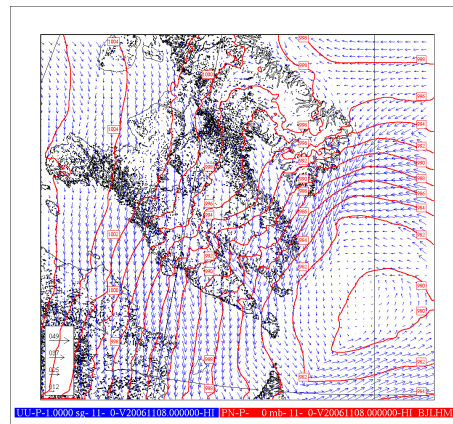
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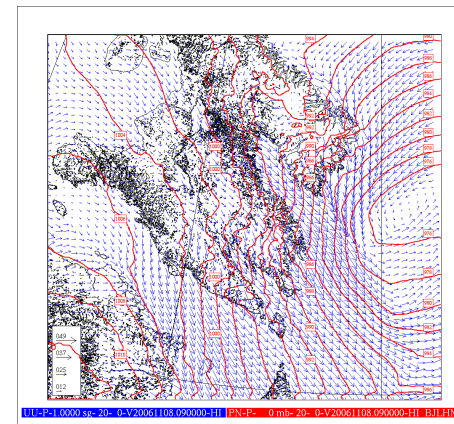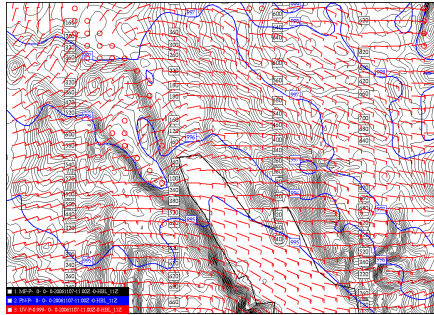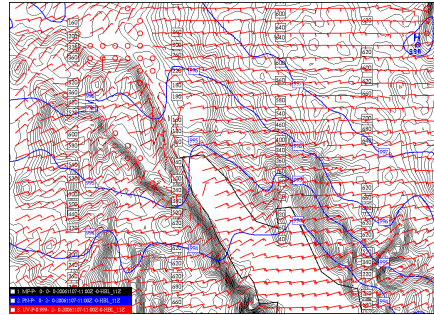# Sea Level Pressure and Surface Wind (BELJ_LHM)

(a) 13 Z
(b) 15 Z
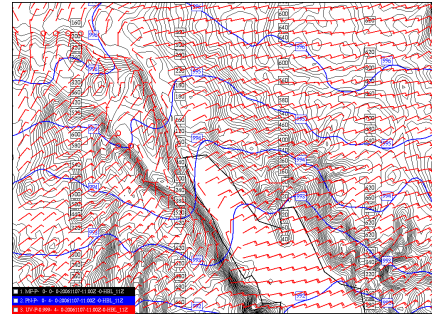(c) 18 Z
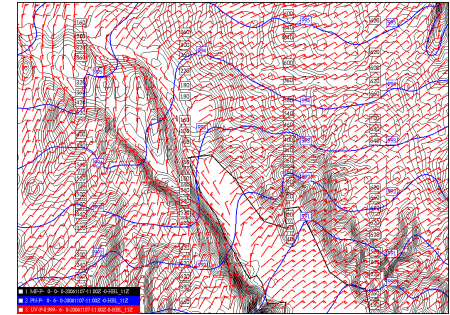
(d) 21 Z
(e) 00 Z (+1d)
(f) 09 Z (+1d)

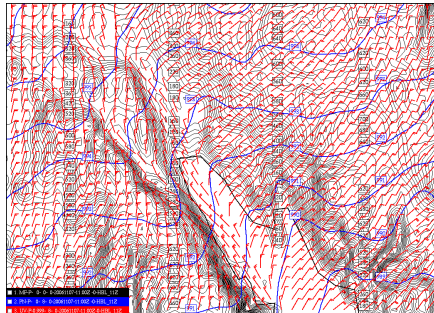3:

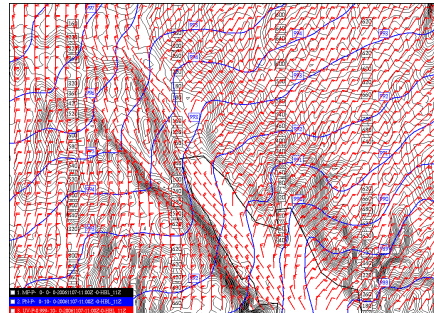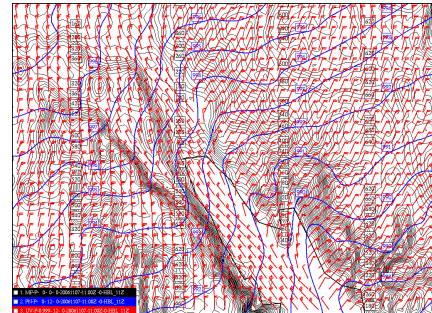# Sea Level Pressure and Surface Wind (HBL_11Z)
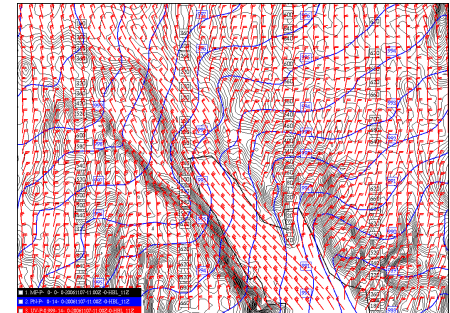
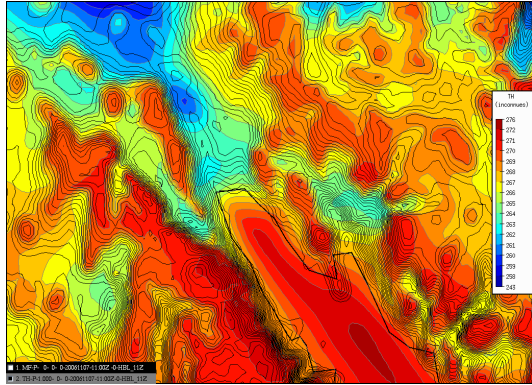

(a) 11 Z
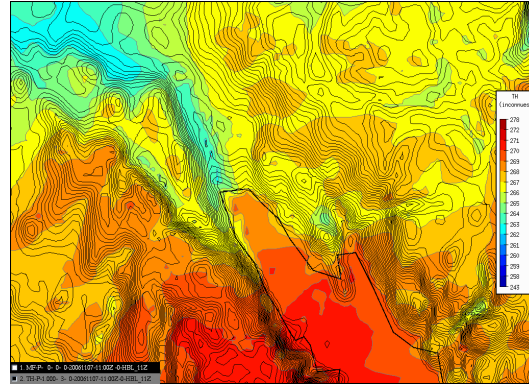
(b) 13 Z

(c) 15 Z
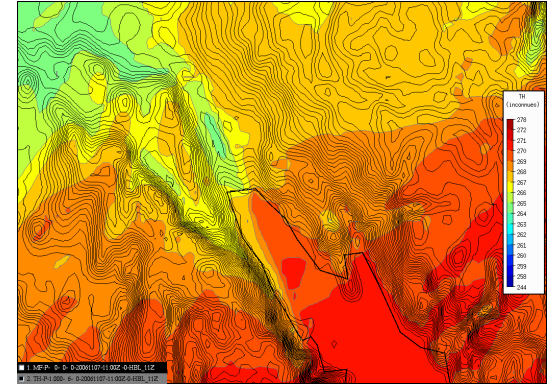
(d) 17 Z

(e) 19 Z

(f) 21 Z

(g) 23 Z

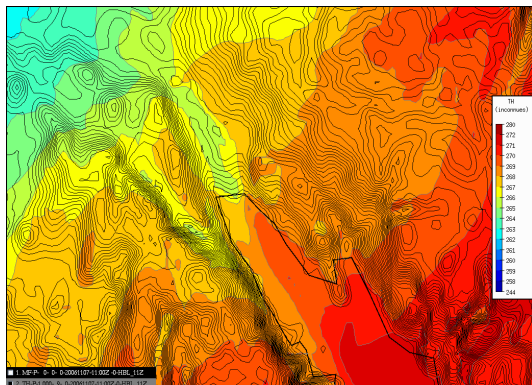(h) 01 Z (+1d)

4:

Surface potential temperature (HBL_11Z)

(a) 11 Z

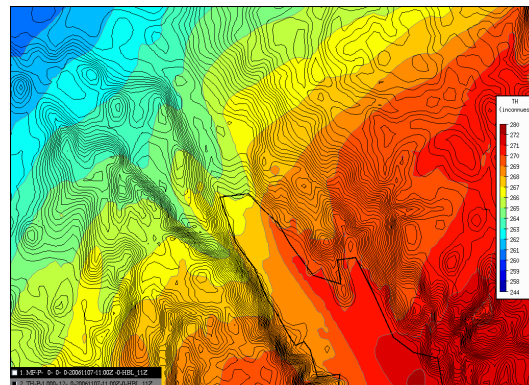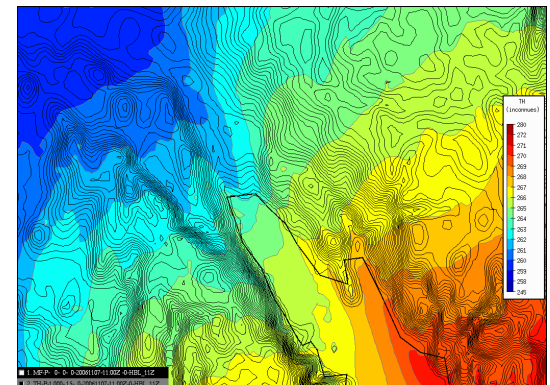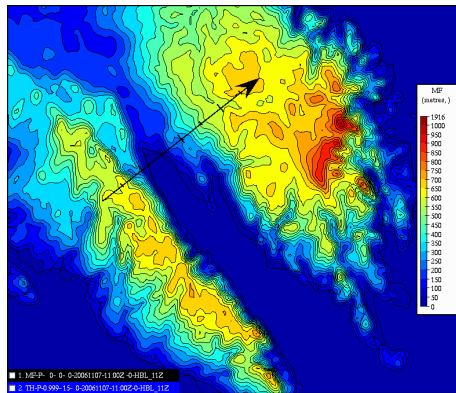(b) 14 Z
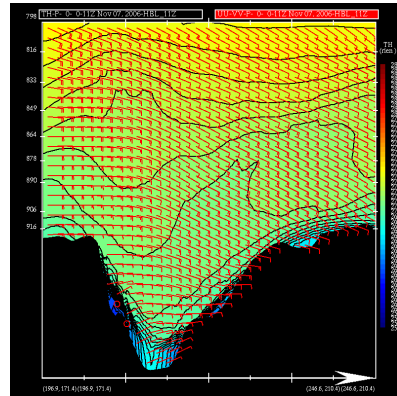
(c) 17 Z

(d) 20 Z

(e) 23 Z
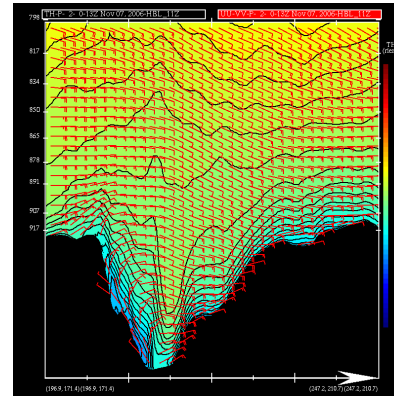
(f) 02 Z (+1d)

5:

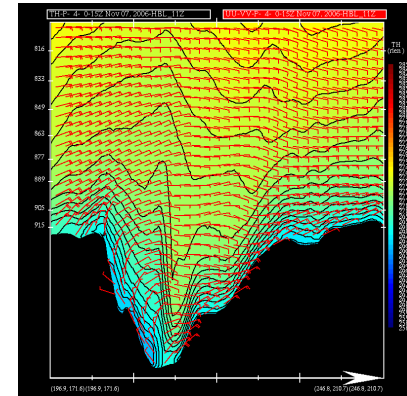# Cross-sections of potential temperature and wind (HBL_11Z)

(a) Cross-section direction
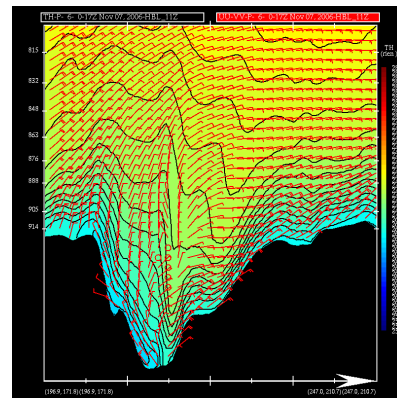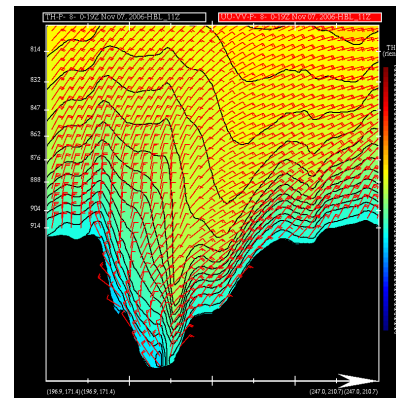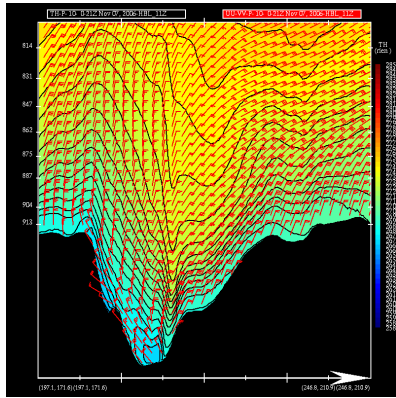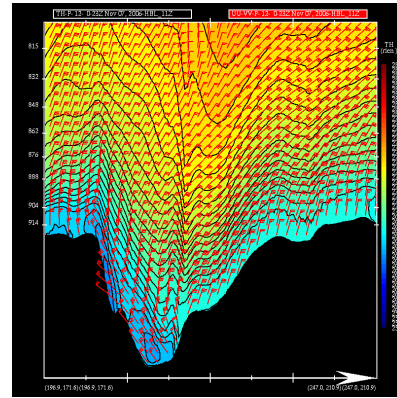
(b) 11 Z

(c) 13 Z
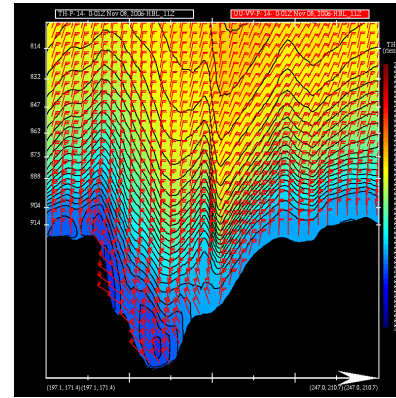
(d) 15 Z

(e) 17 Z

(f) 19 Z

6:

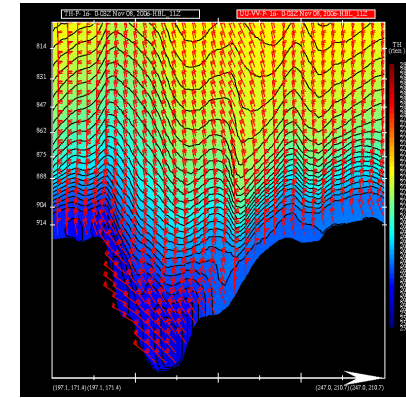# Cross-sections of potential temperature and wind (HBL_11Z)
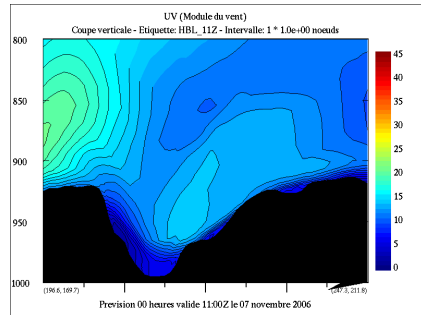

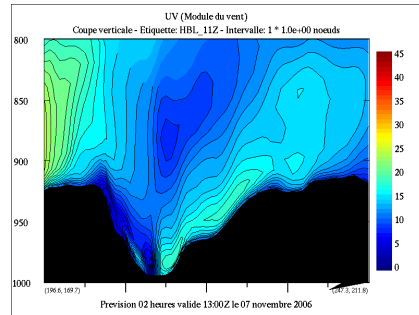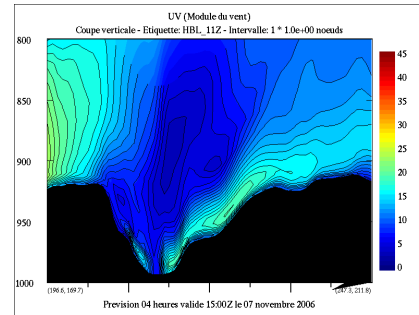(a) 21:00 UTC   (b) 23:00 UTC   (c) 01:00 UTC (+1d)   (d) 03:00 UTC (+1d)
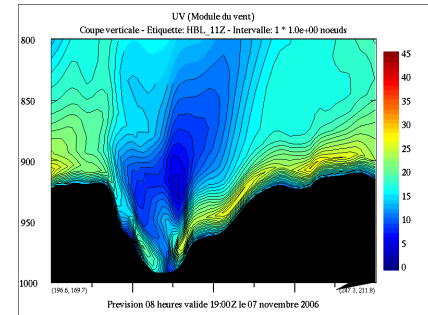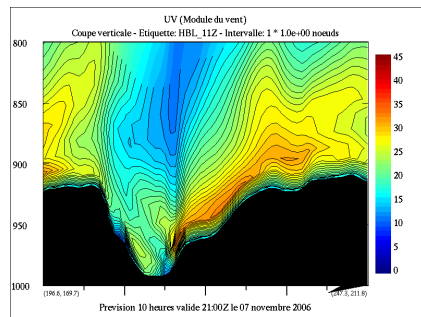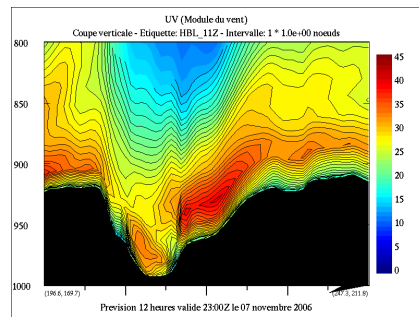
7:

Cross-sections of wind speed (HBL_11Z)
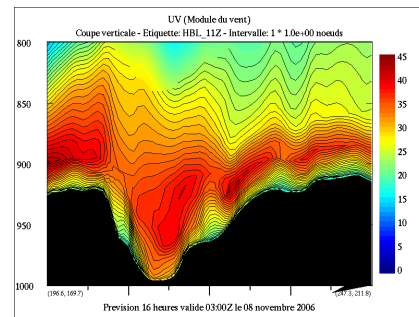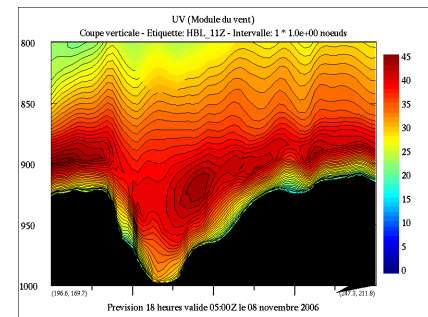

(a) 11 Z (b) 13 Z (c) 15 Z (d) 19 Z
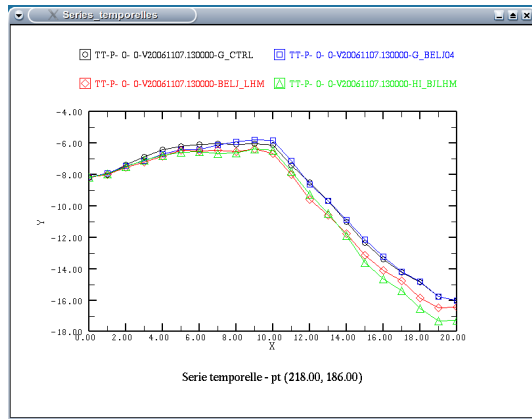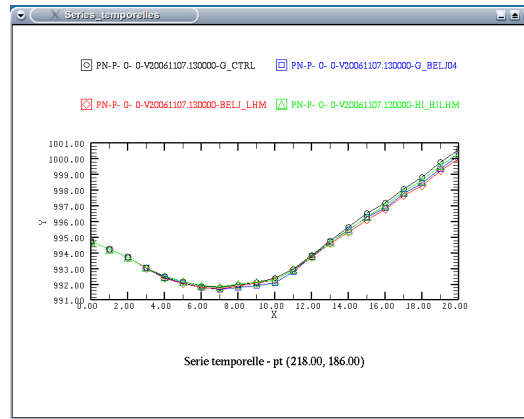
(e) 21 Z (f) 23 Z (g) 03 Z (h) 05 Z
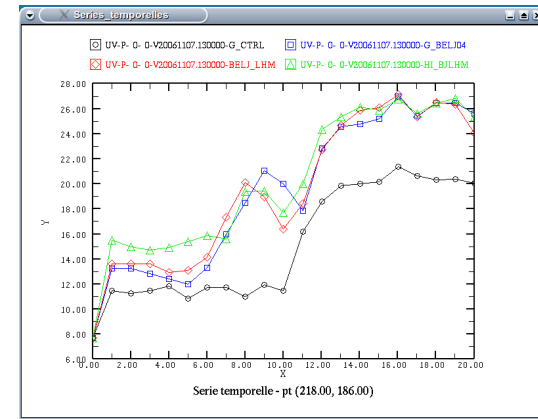
8:

Time series of surface variables at Iqaluit

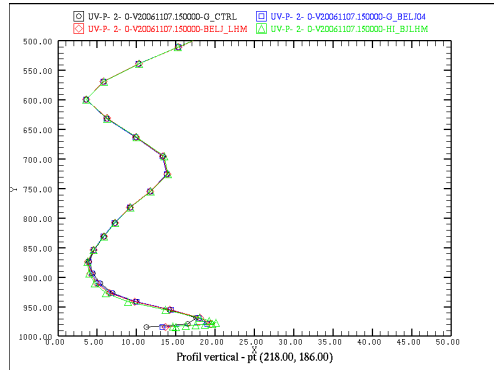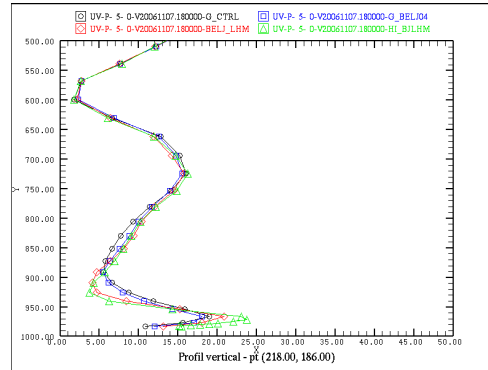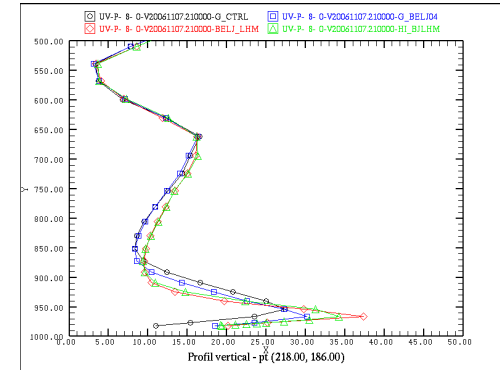(a) Temperature (1.5 m)   (b) Sea level pressure   (c) Wind speed (10 m)
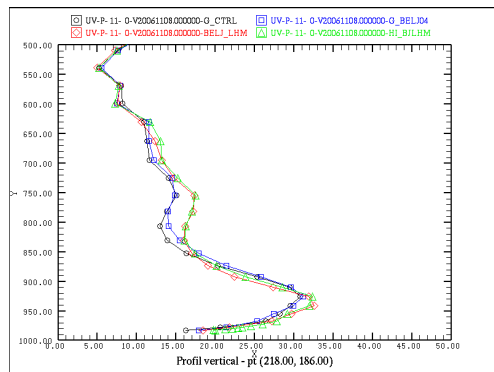
9:

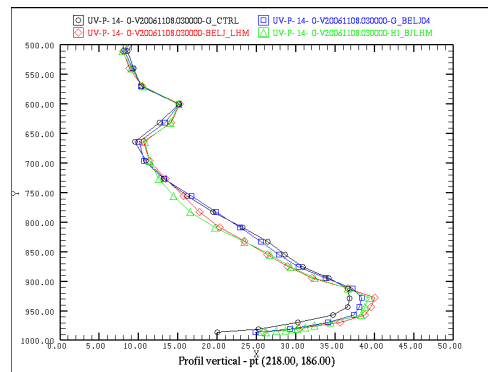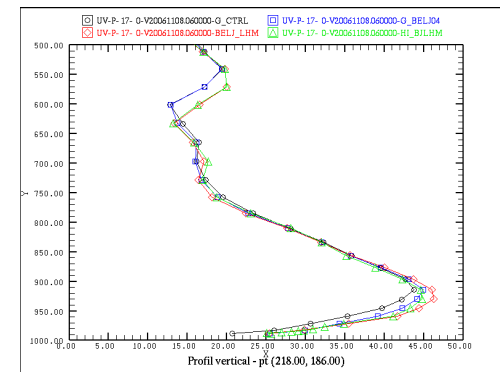# Wind speed profiles at Iqaluit and over the bay
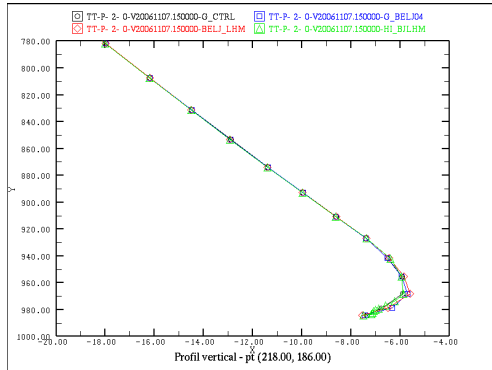

(a) 15:00 UTC

(b) 18:00 UTC

(c) 21:00 UTC

(d) 00:00 UTC

(e) 03:00 UTC

(f) 06:00 UTC

10:

Temperature profiles at Iqaluit

(a) 15:00 UTC

(b) 18:00 UTC

(c) 21:00 UTC

(d) 00:00 UTC

(e) 03:00 UTC
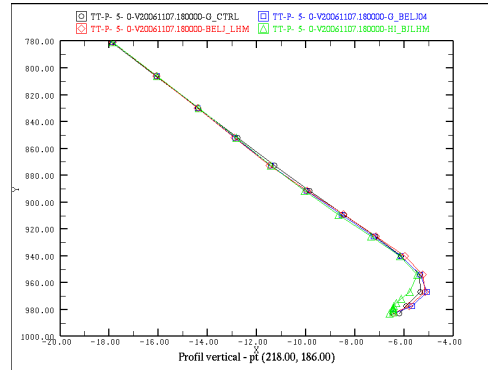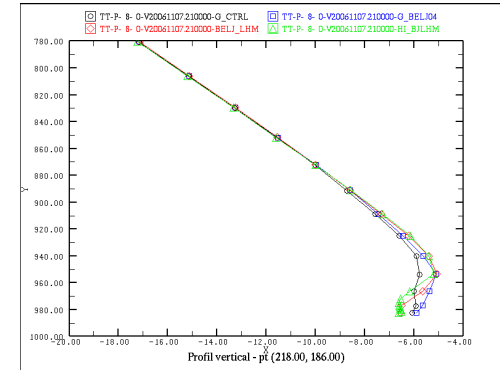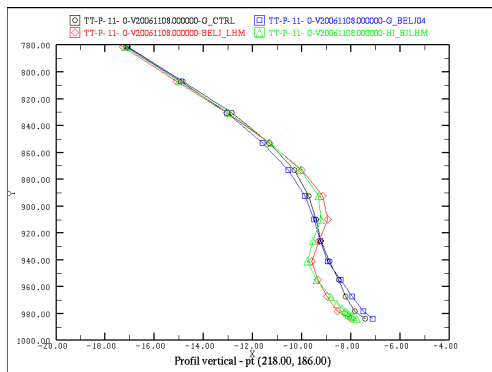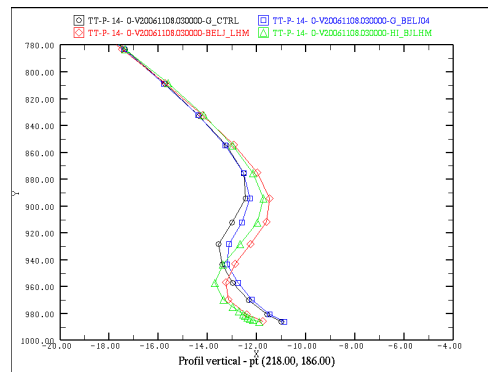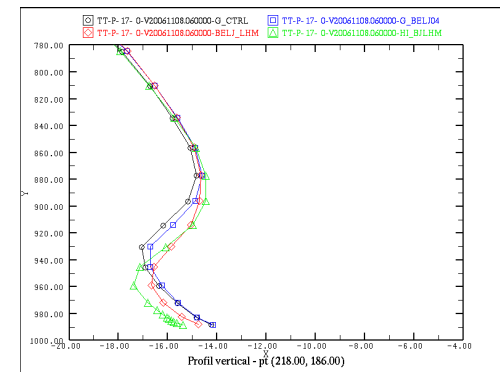
(f) 06:00 UTC

11:

Conclusions

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