Velocity statistics from the CONMAN models and observations

J. H. LaCasce

MetOs, UiO

Overview

1. Regional characteristics

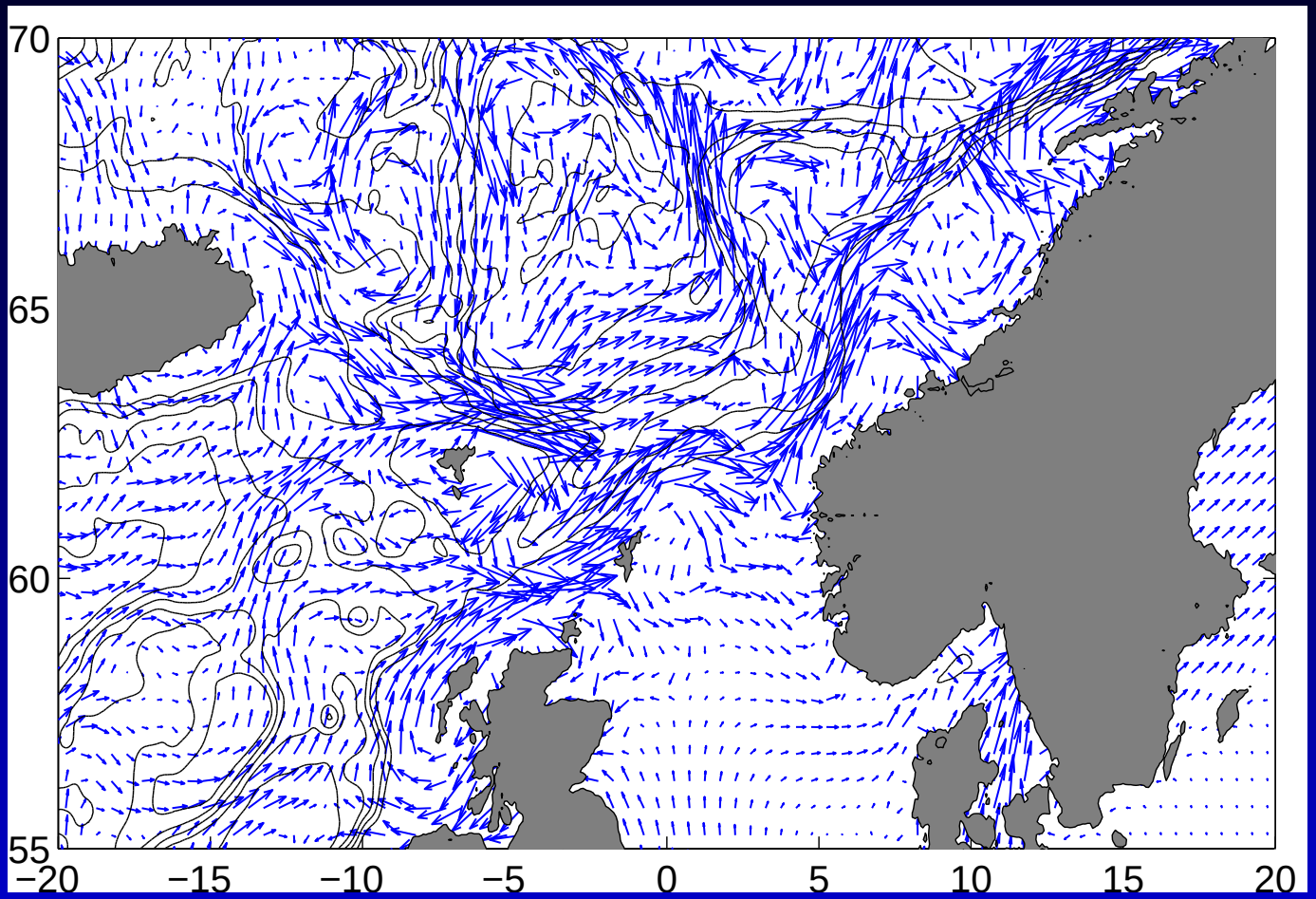
   Velocities at 50, 100 and 400 m
   Means, standard deviations

2. Svinøy statistics

   Speed, direction probabilities
   Means, standard deviations

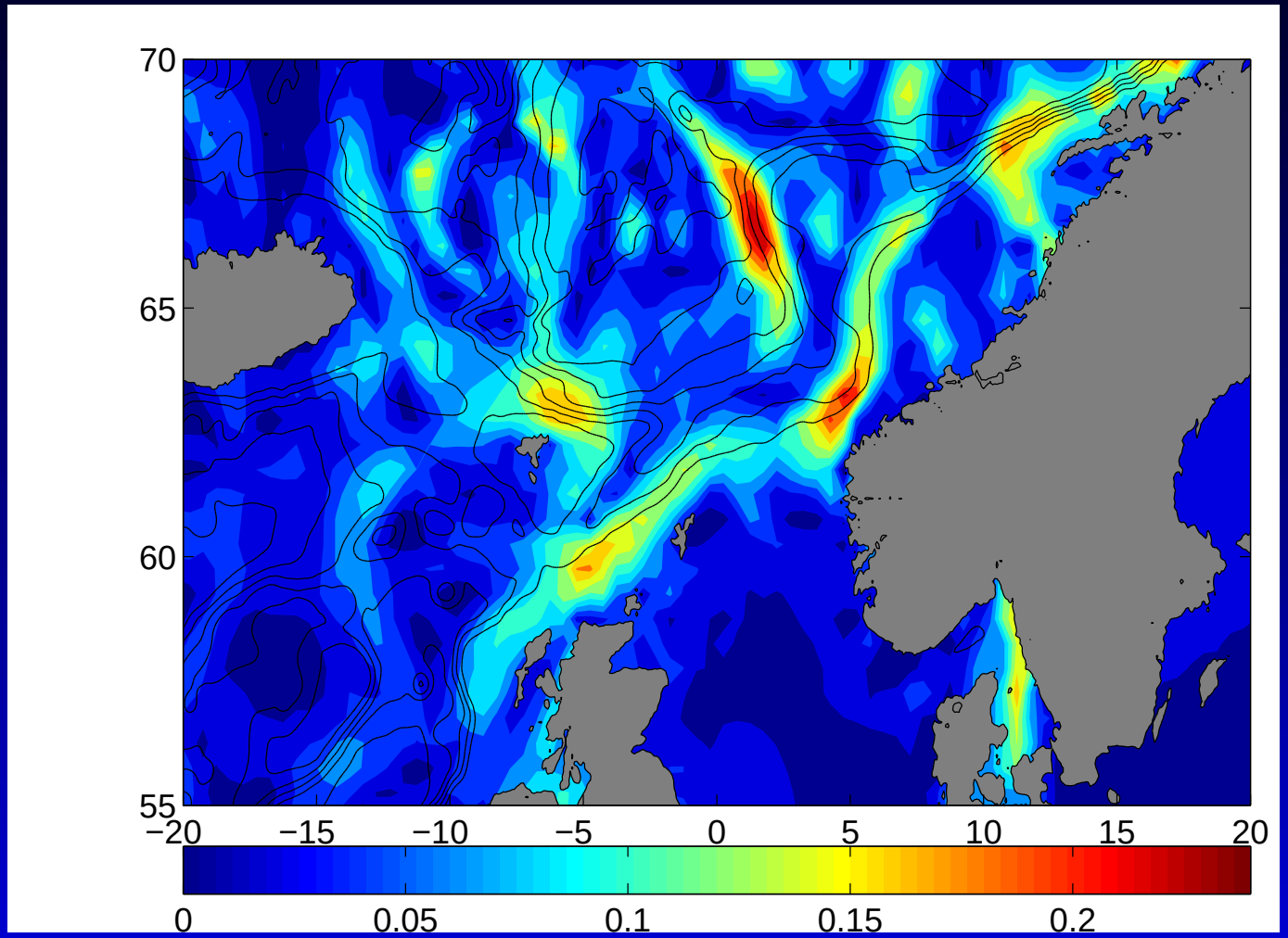
3. Summary

Observed surface velocities



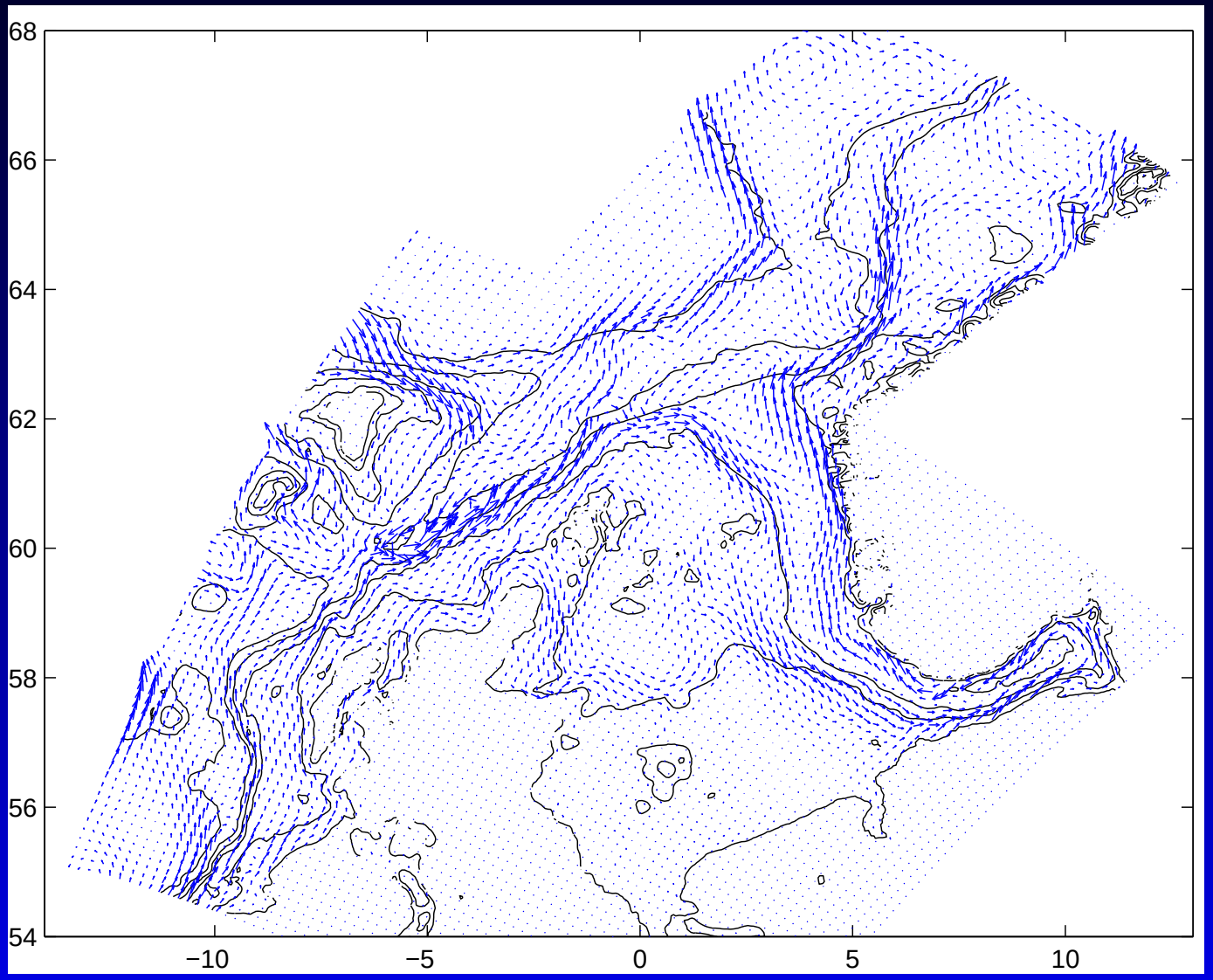
Rio05 (CLS Space Oceanography Division, AVISO)

Surface speeds

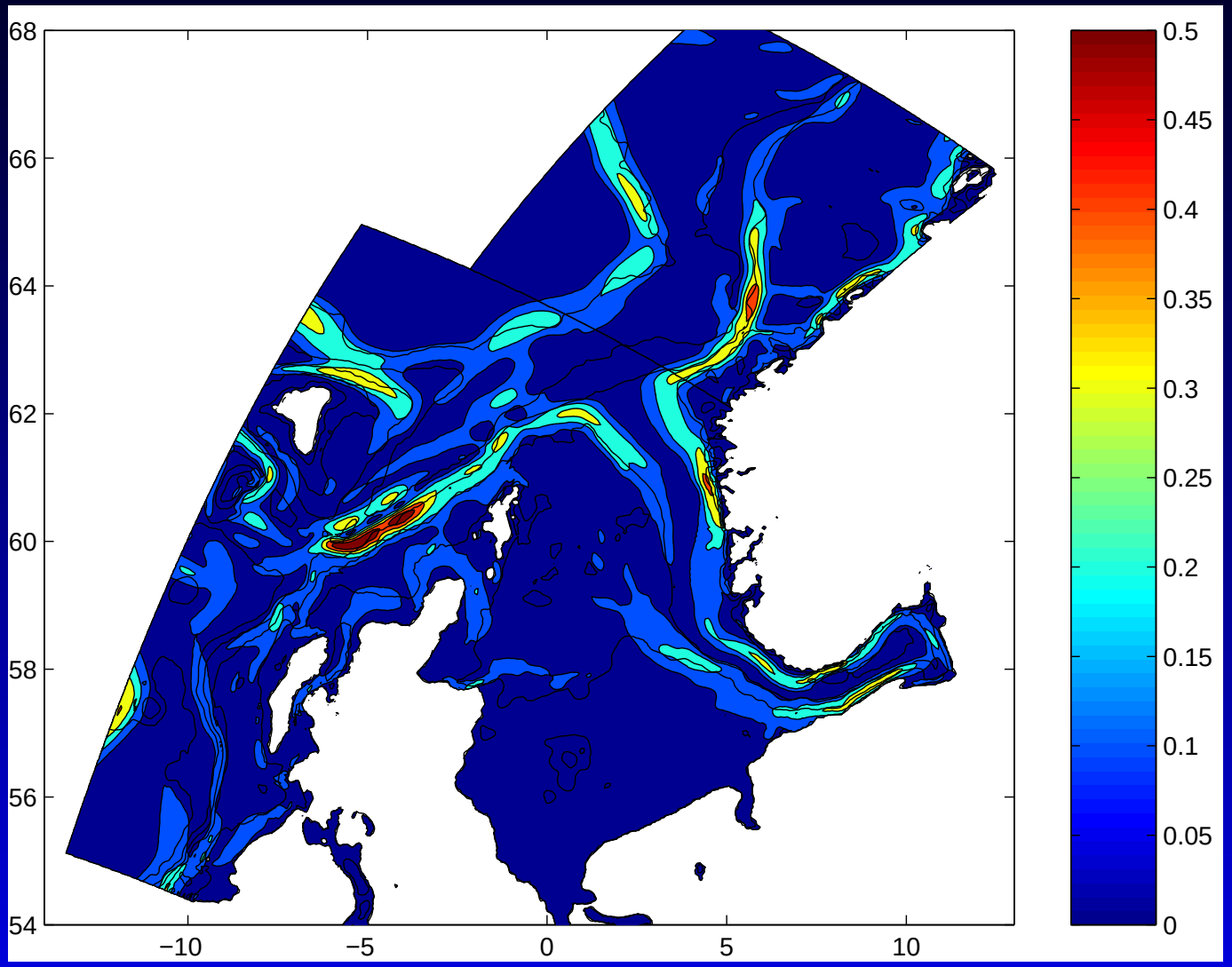


(courtesy P. E. Isachsen)

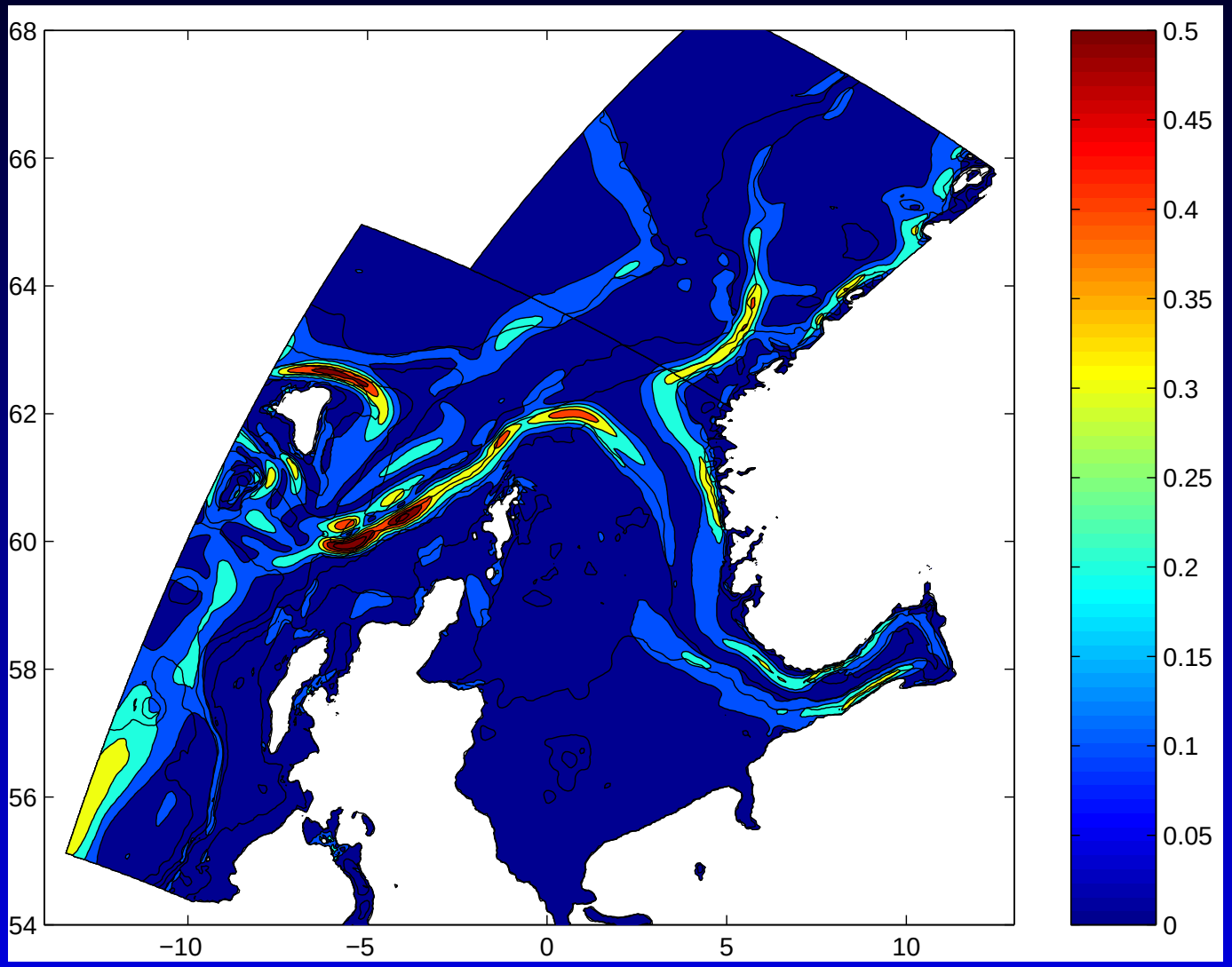
MIPOM/EKASC: 50 m



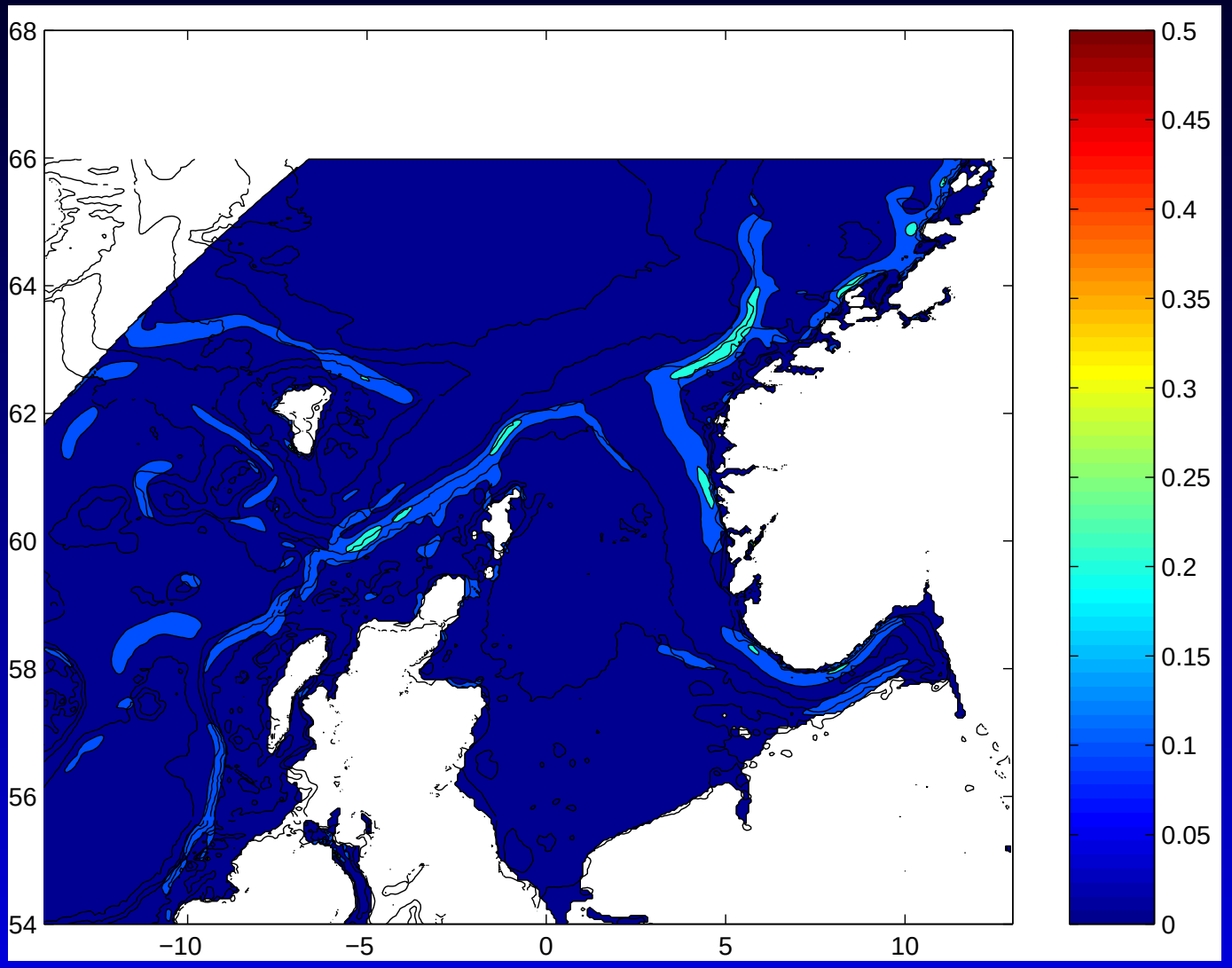
MIPOM/EKASC: speed, 50 m



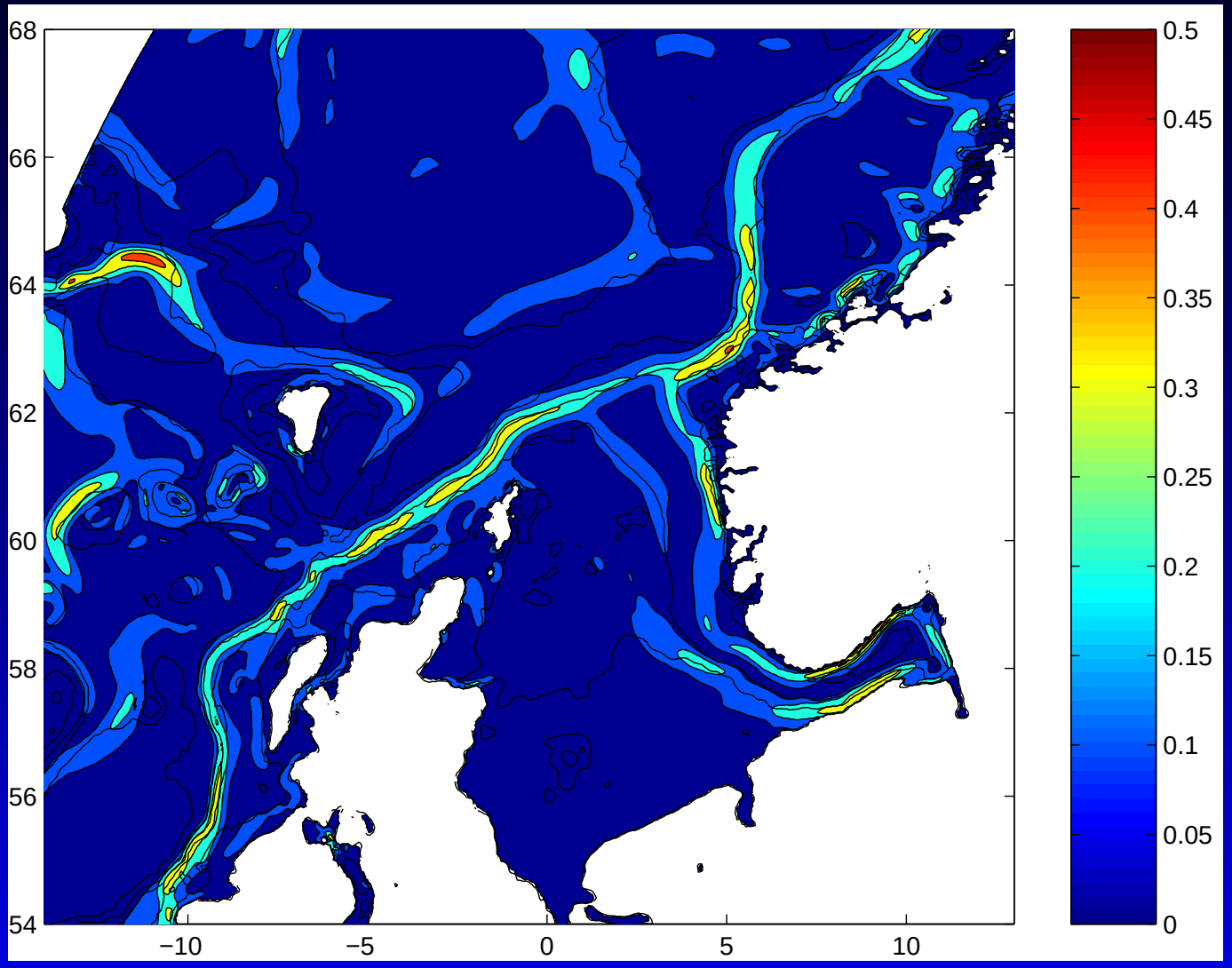
MIPOM/TOPAZ: speed, 50 m



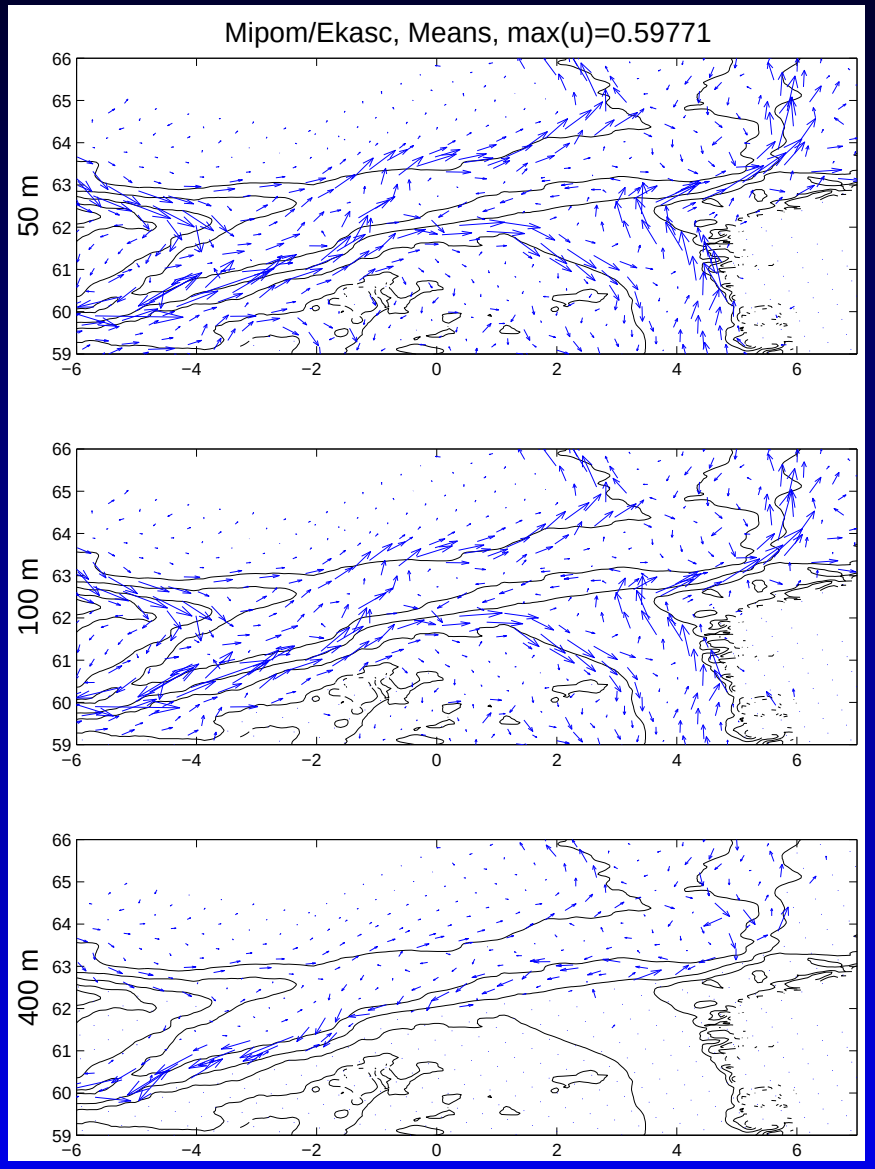
HYCOM: speed, 50 m



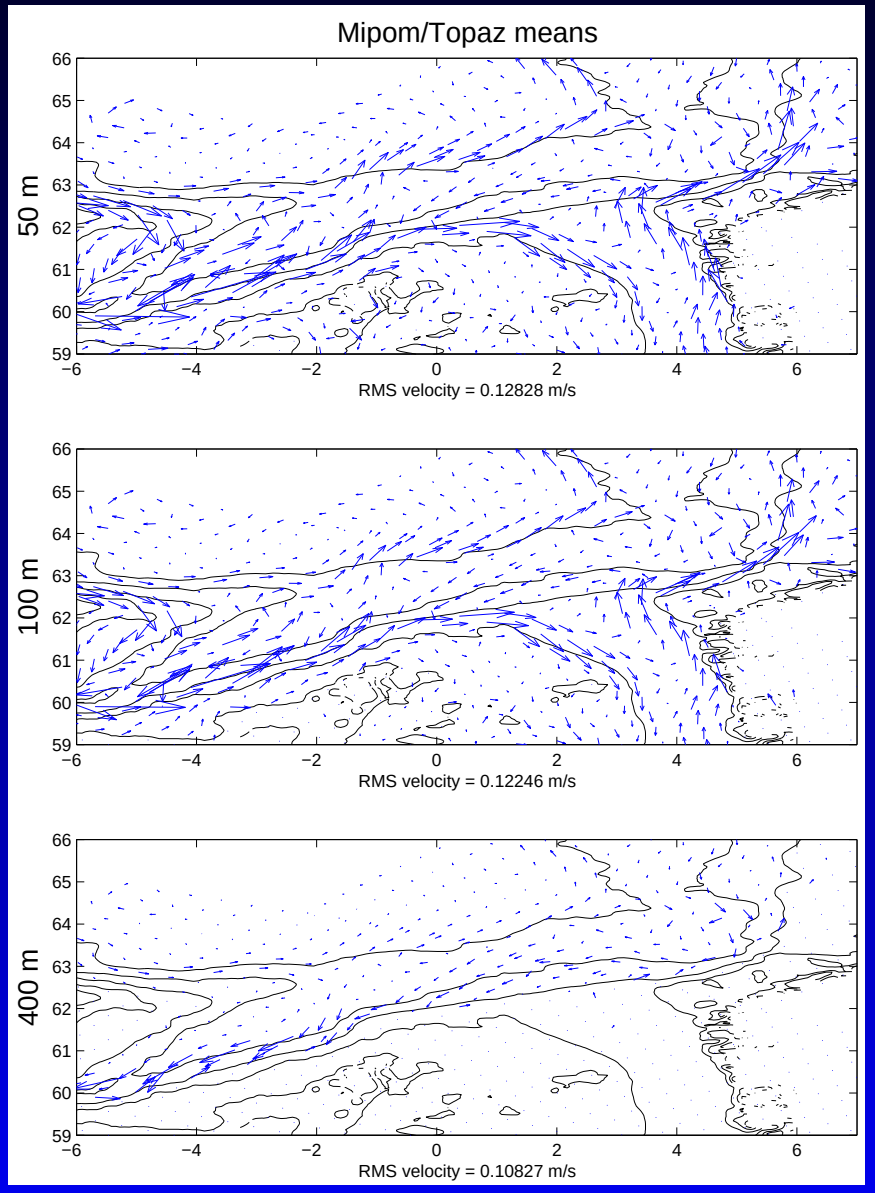
ROMS: speed, 50 m



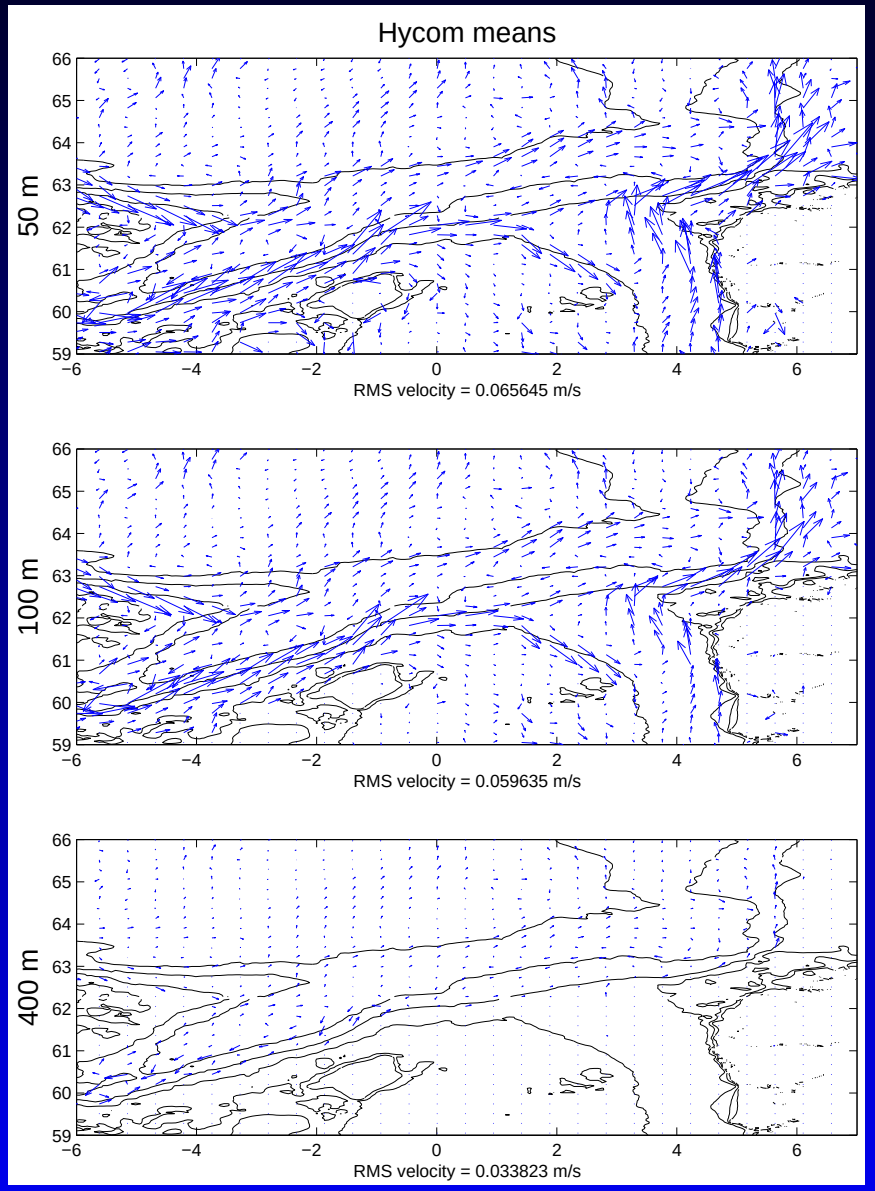
M/E: 50, 100, 400 m



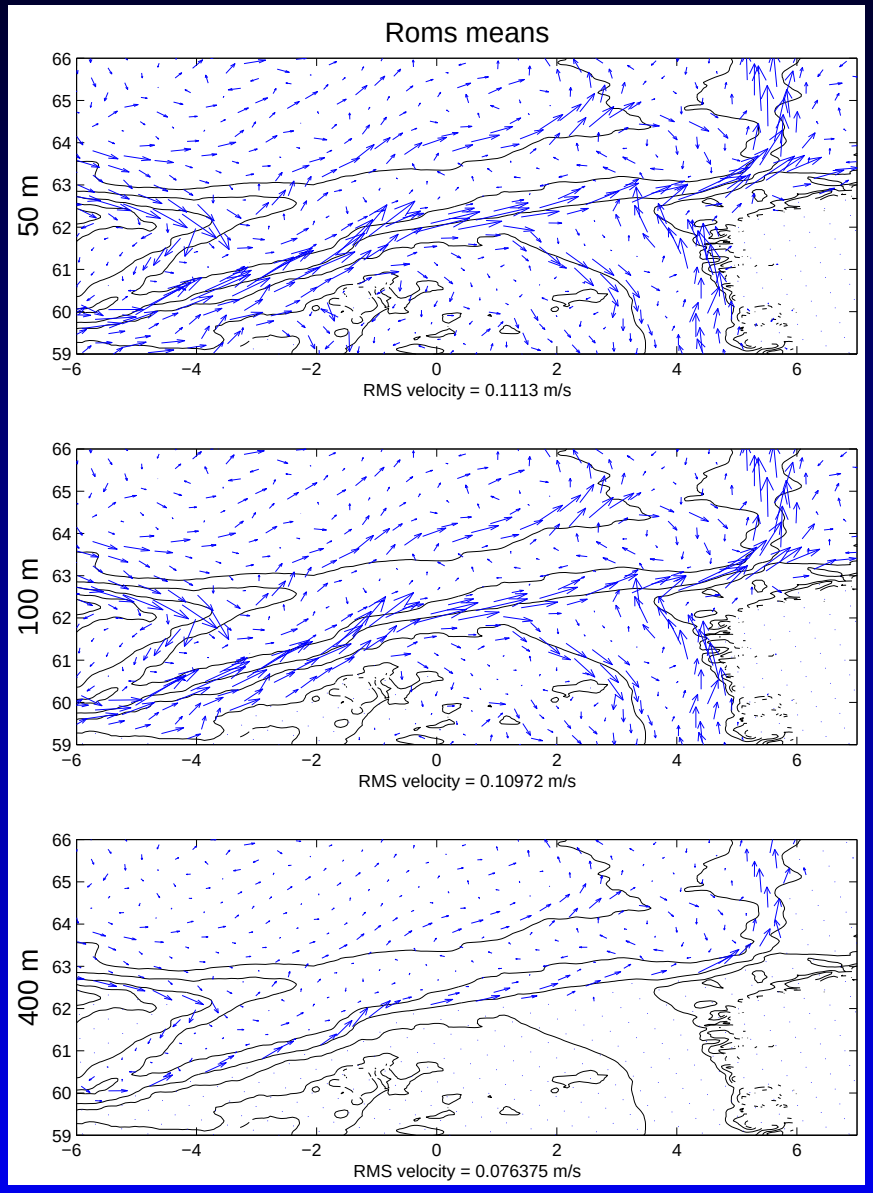
M/T: 50, 100, 400 m



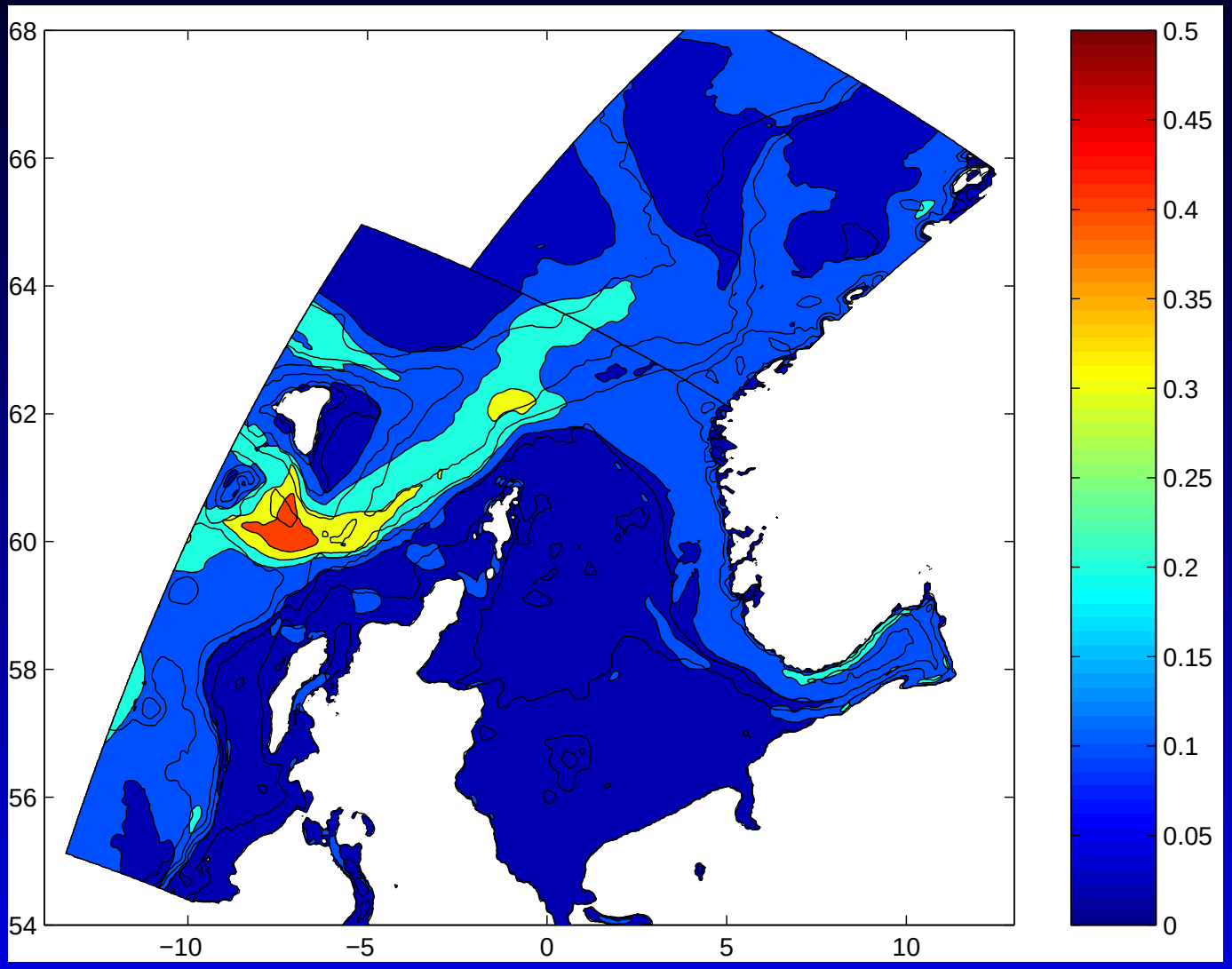
HYCOM: 50, 100, 400 m



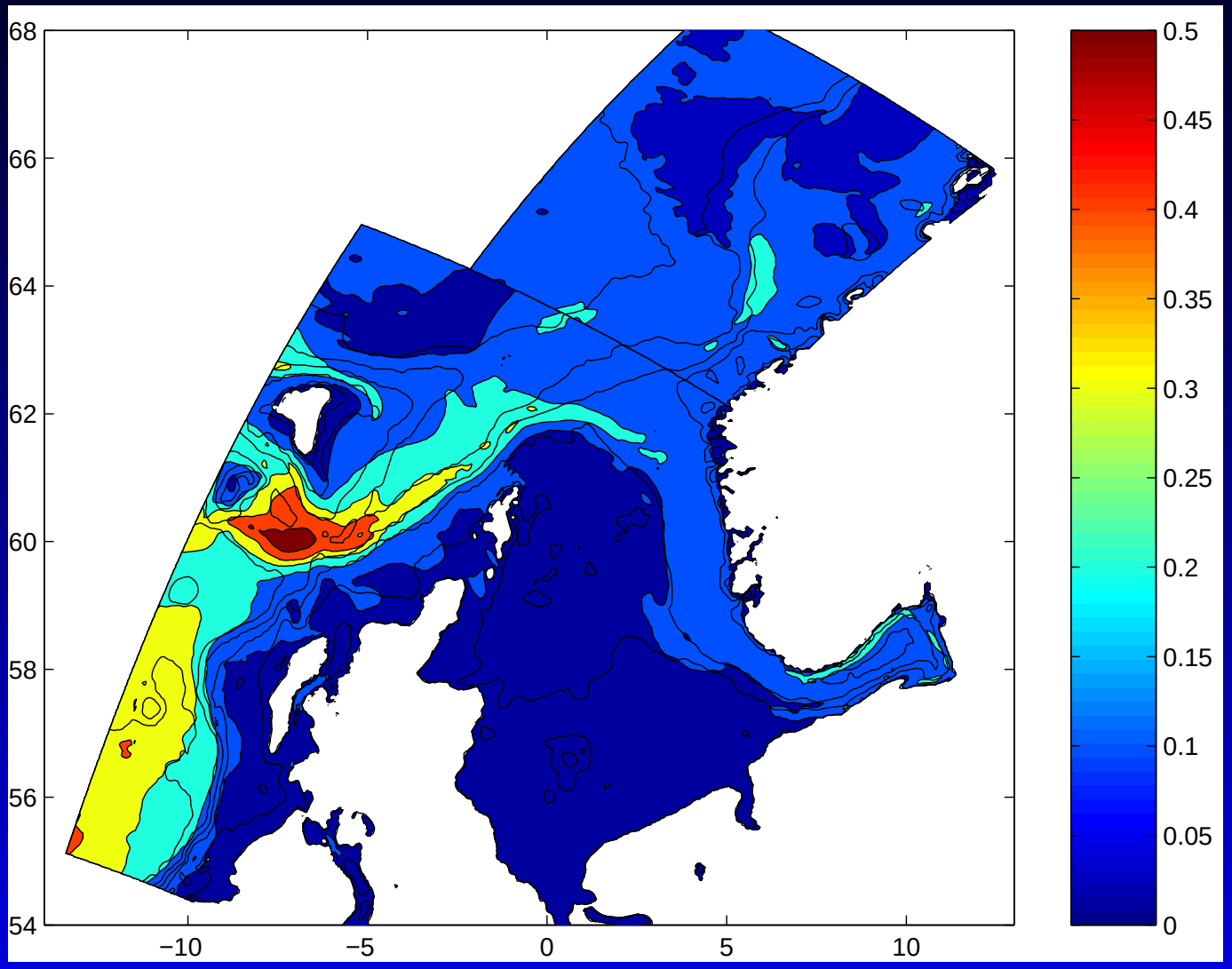
ROMS: 50, 100, 400 m



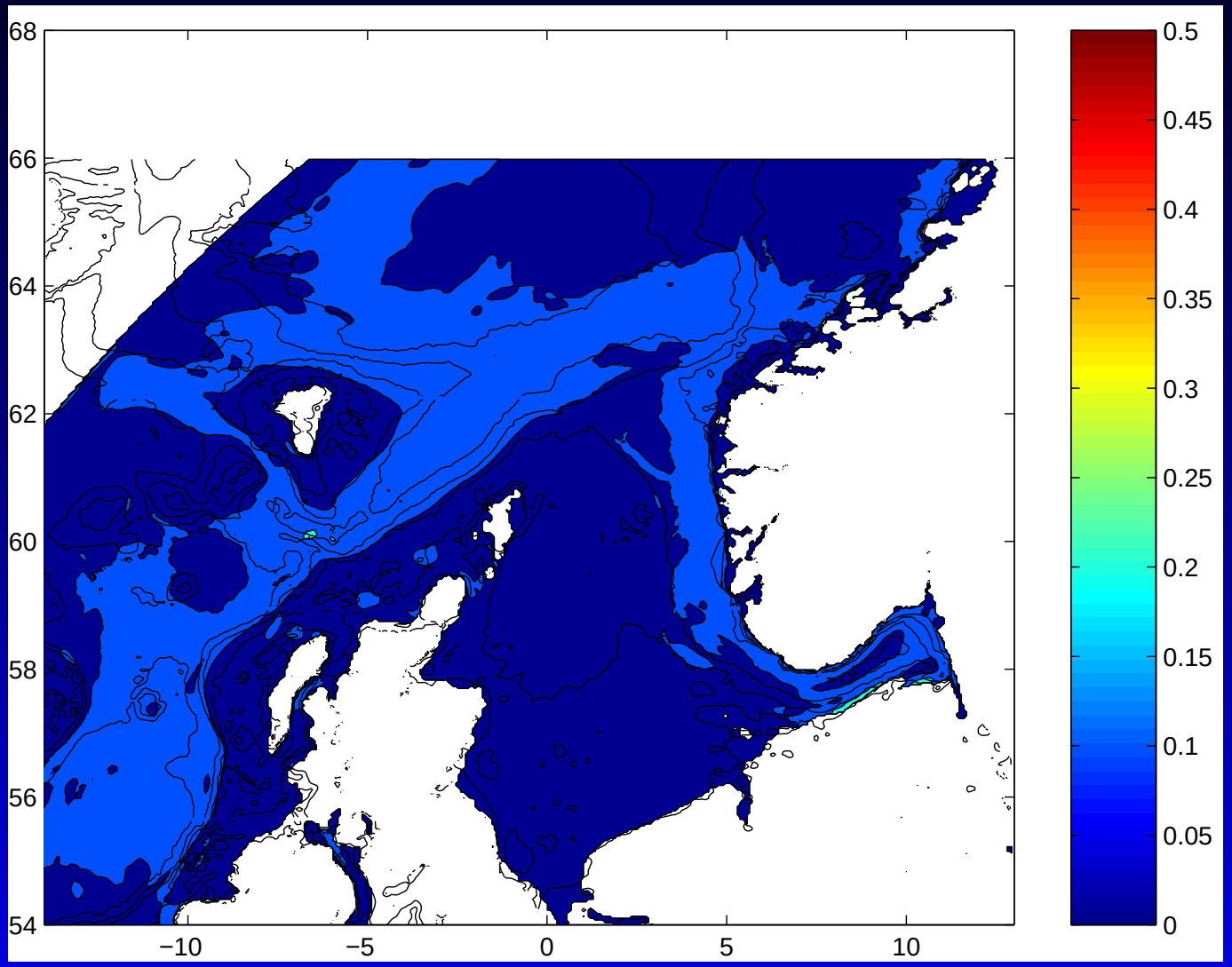
M/E: deviations, 50 m



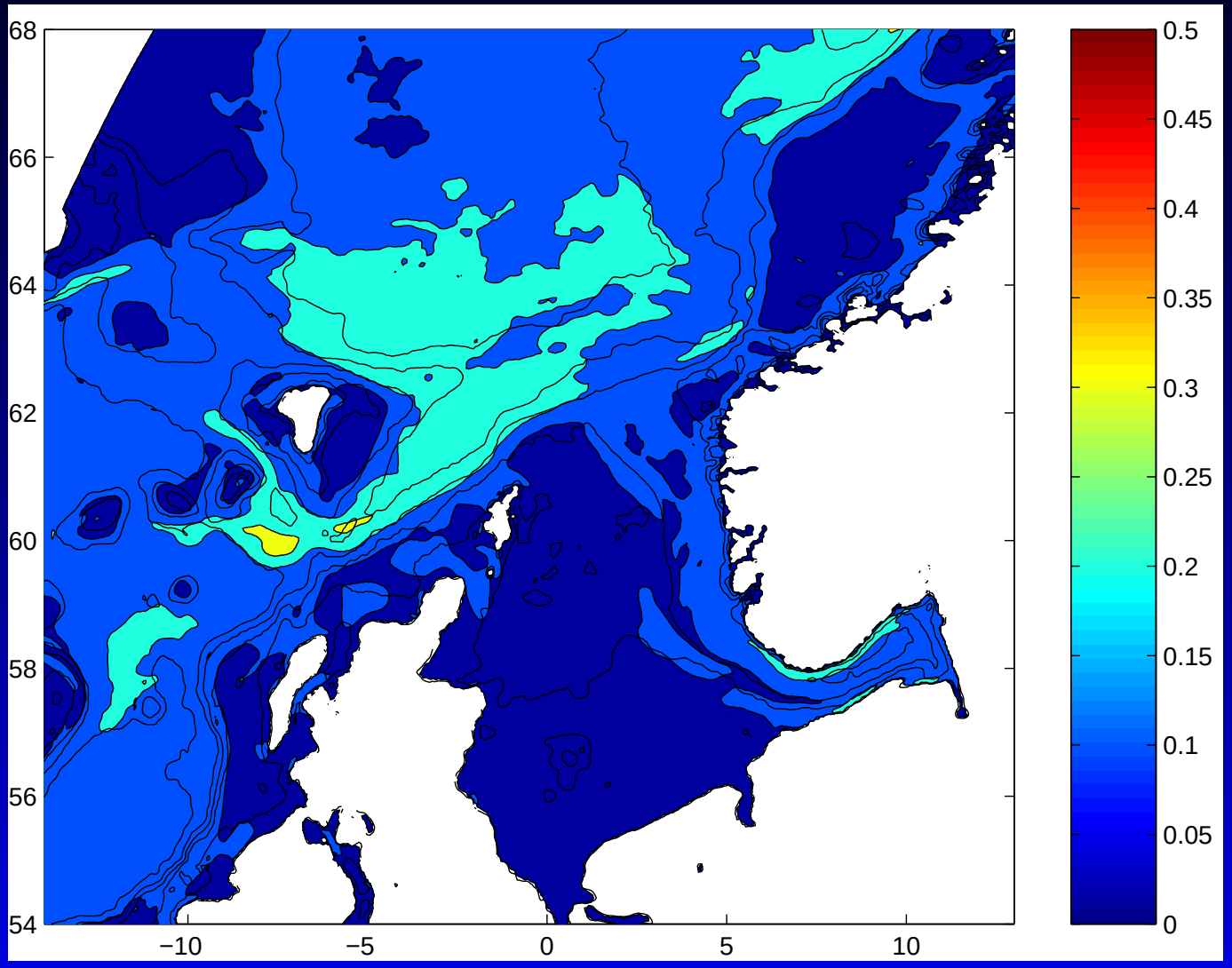
M/T: deviations, 50 m



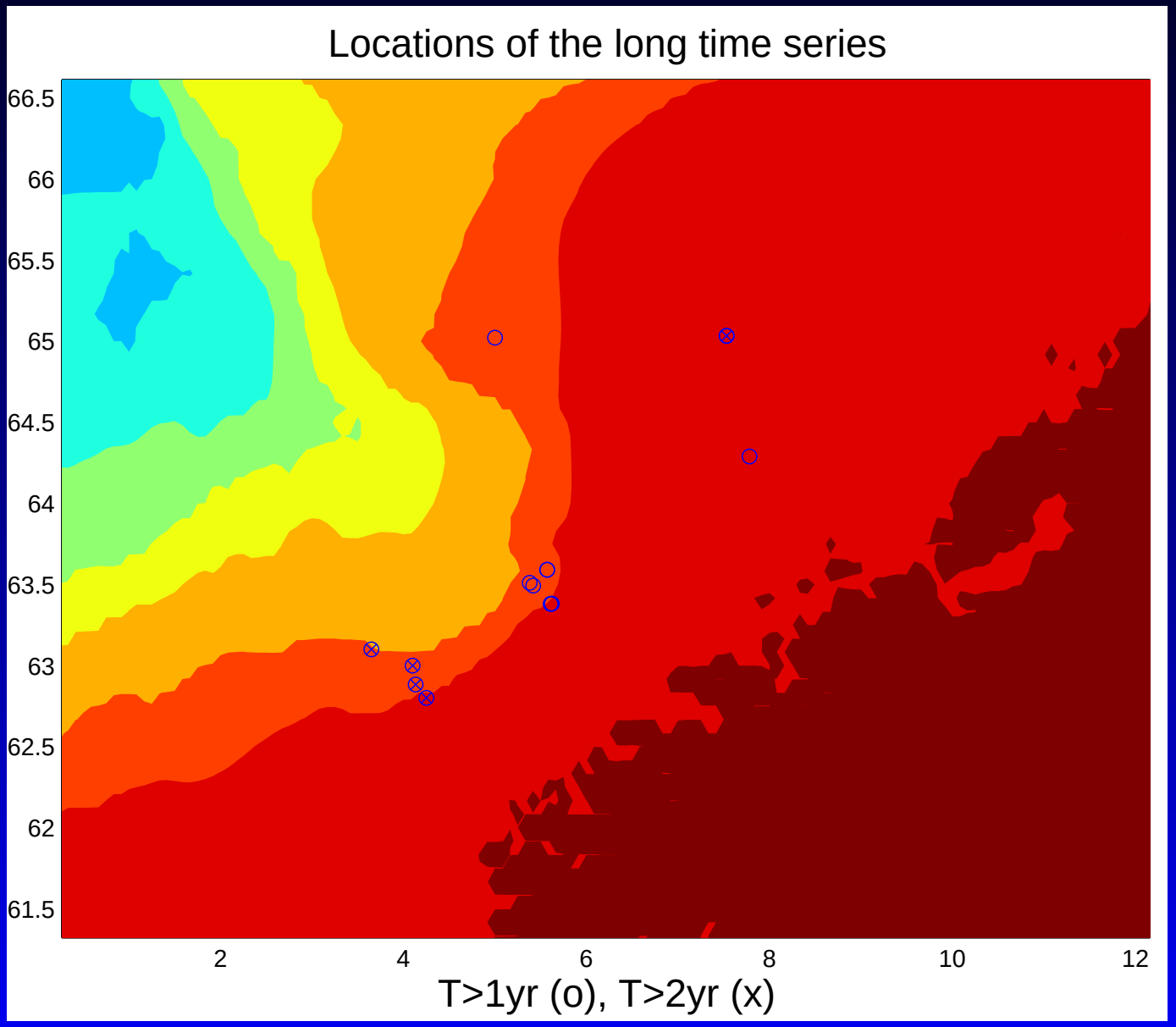
HYCOM: deviations, 50 m



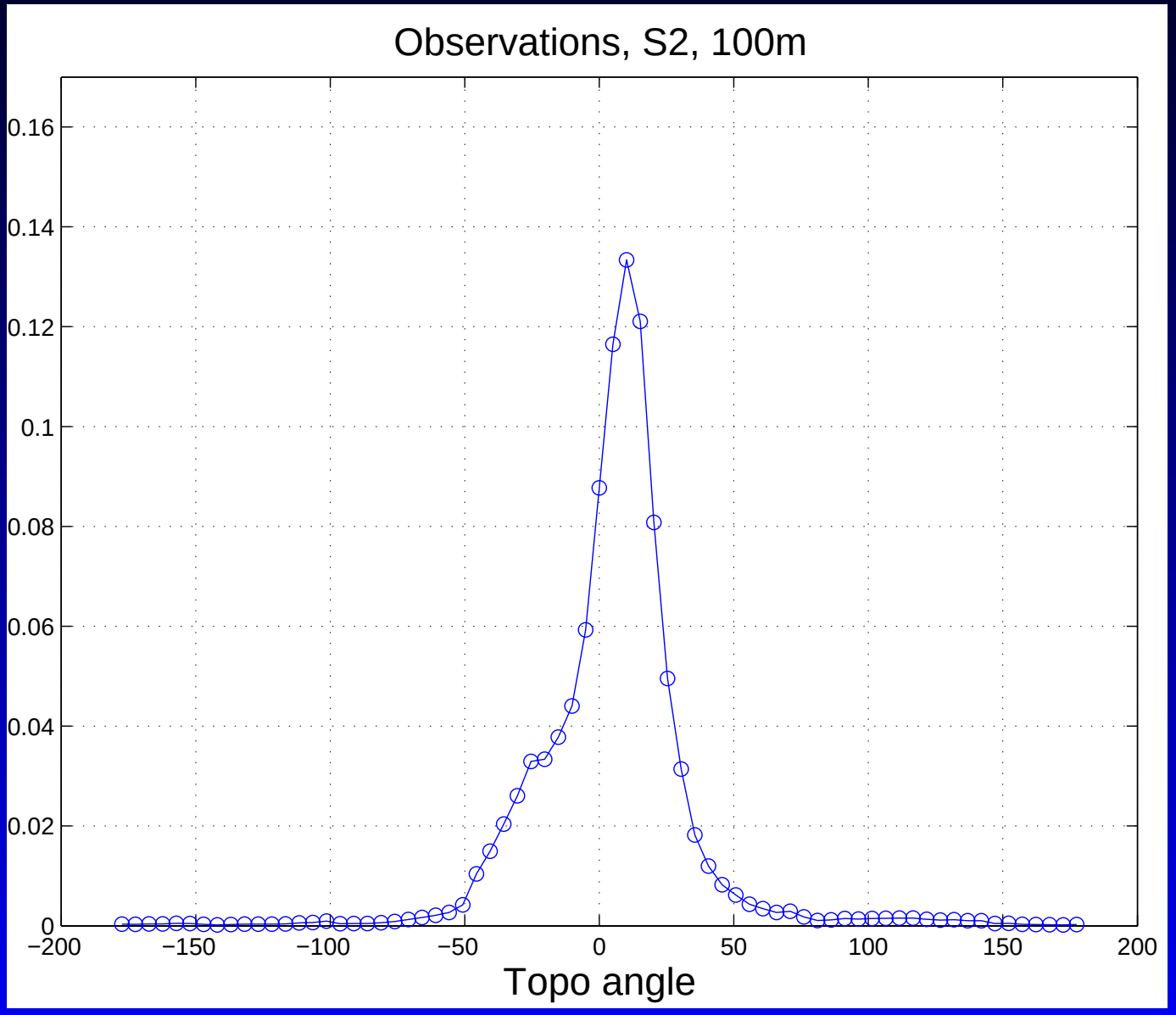
ROMS: deviations, 50 m



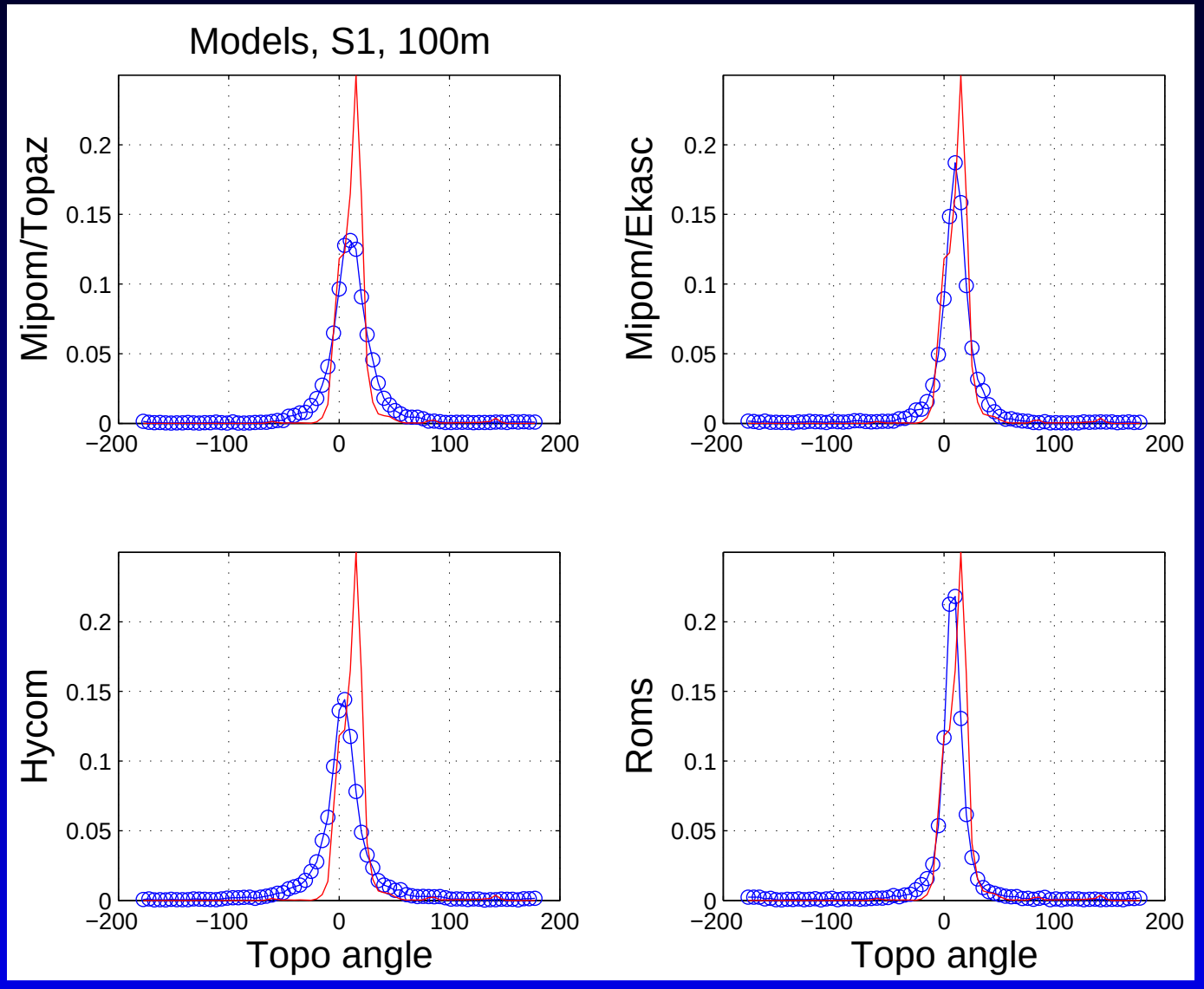
Current meters



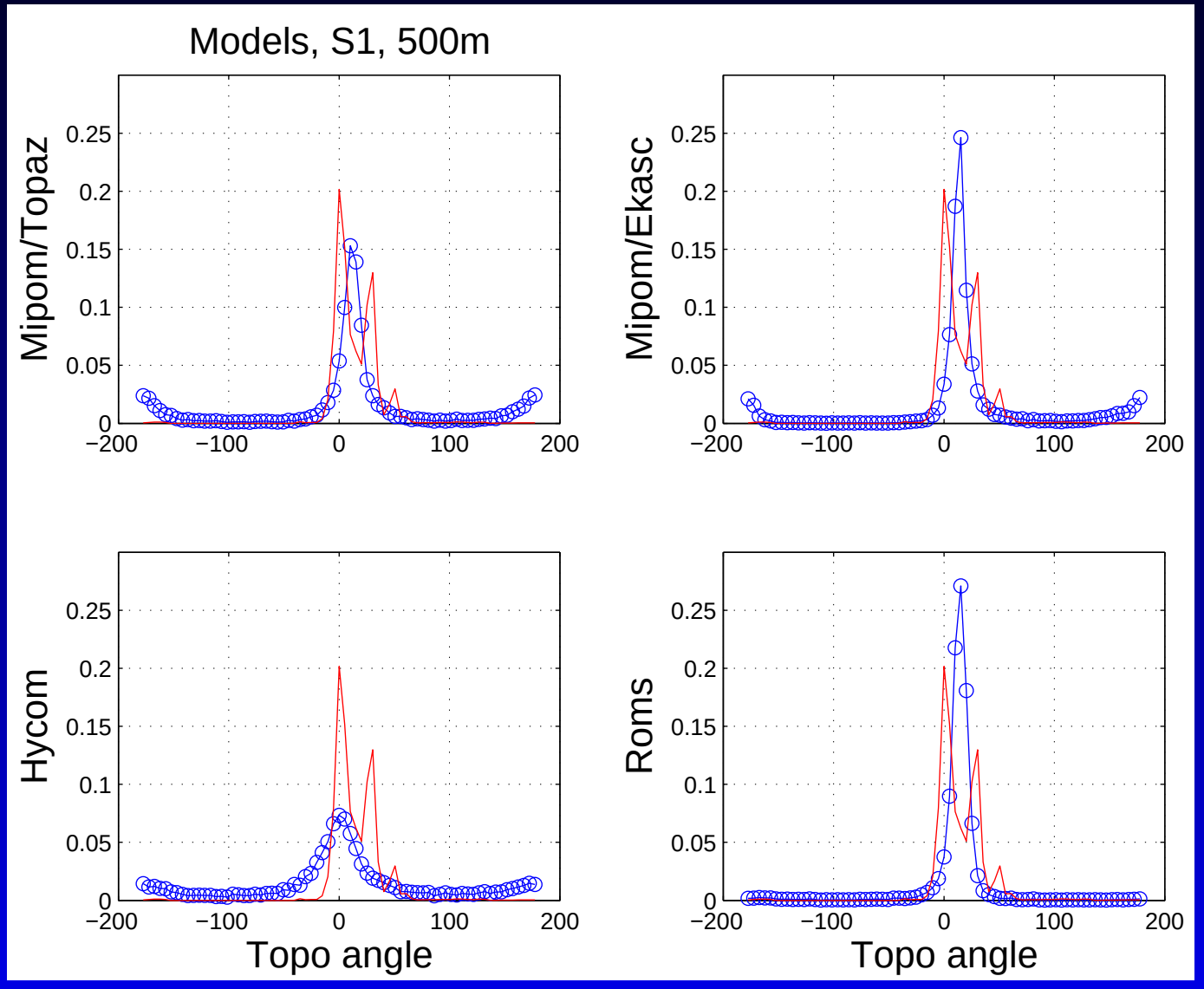
Topo Angle


Observations, S2, 100m
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
−200
−150
−100
−50
0
50
100
150
200
Topo angle

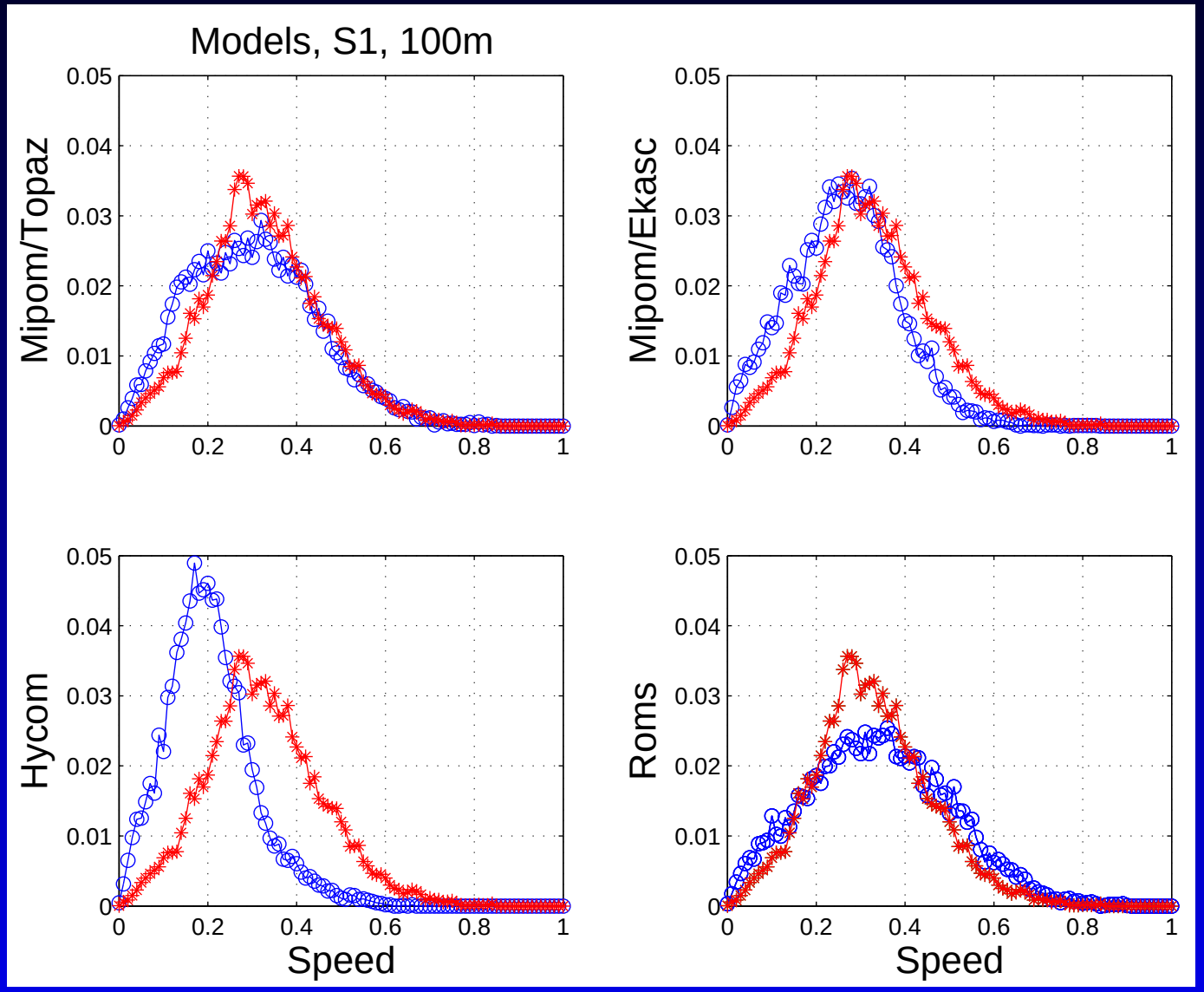
Topo Angle: S1, 100 m



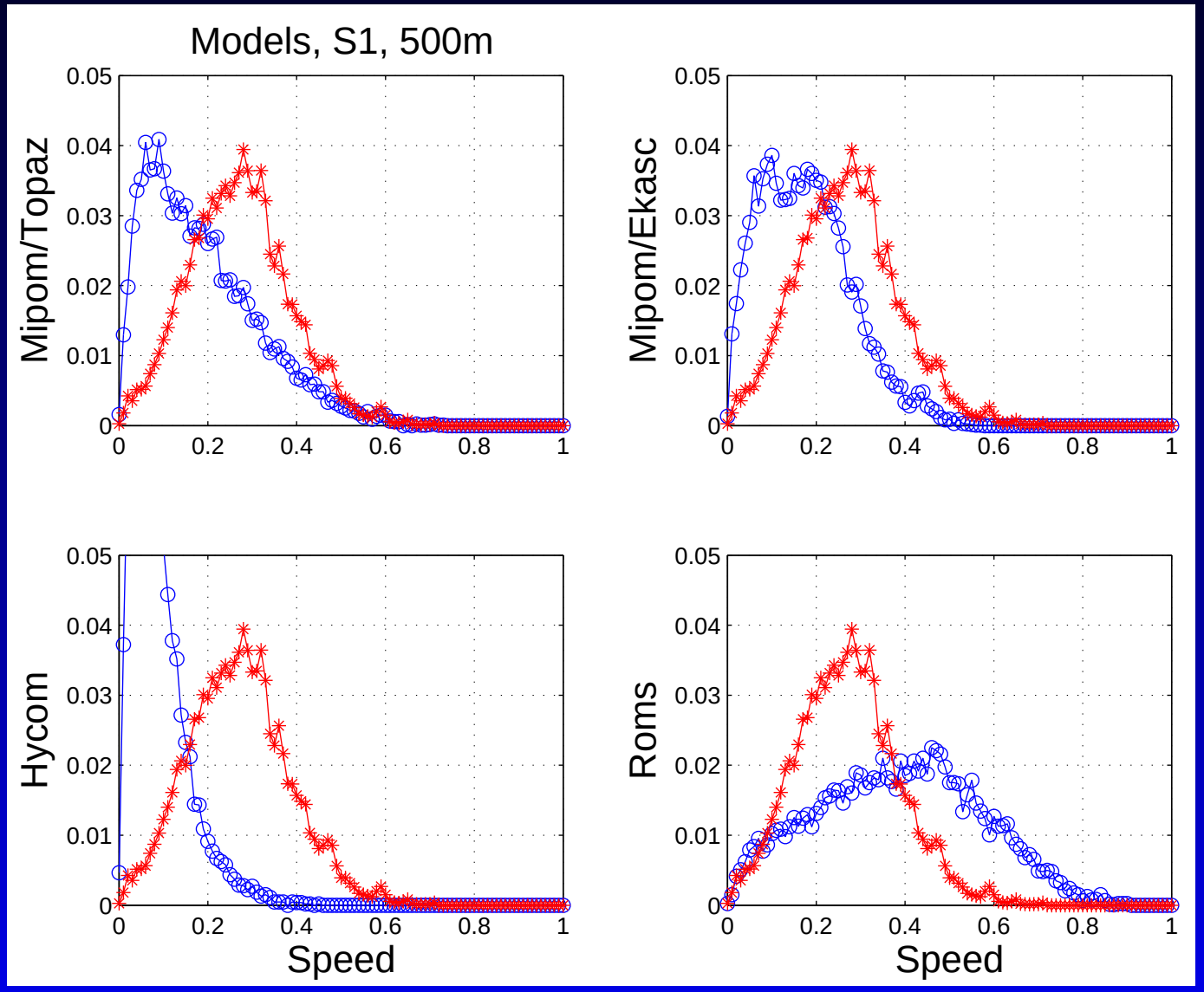
Topo Angle: S1, 500 m



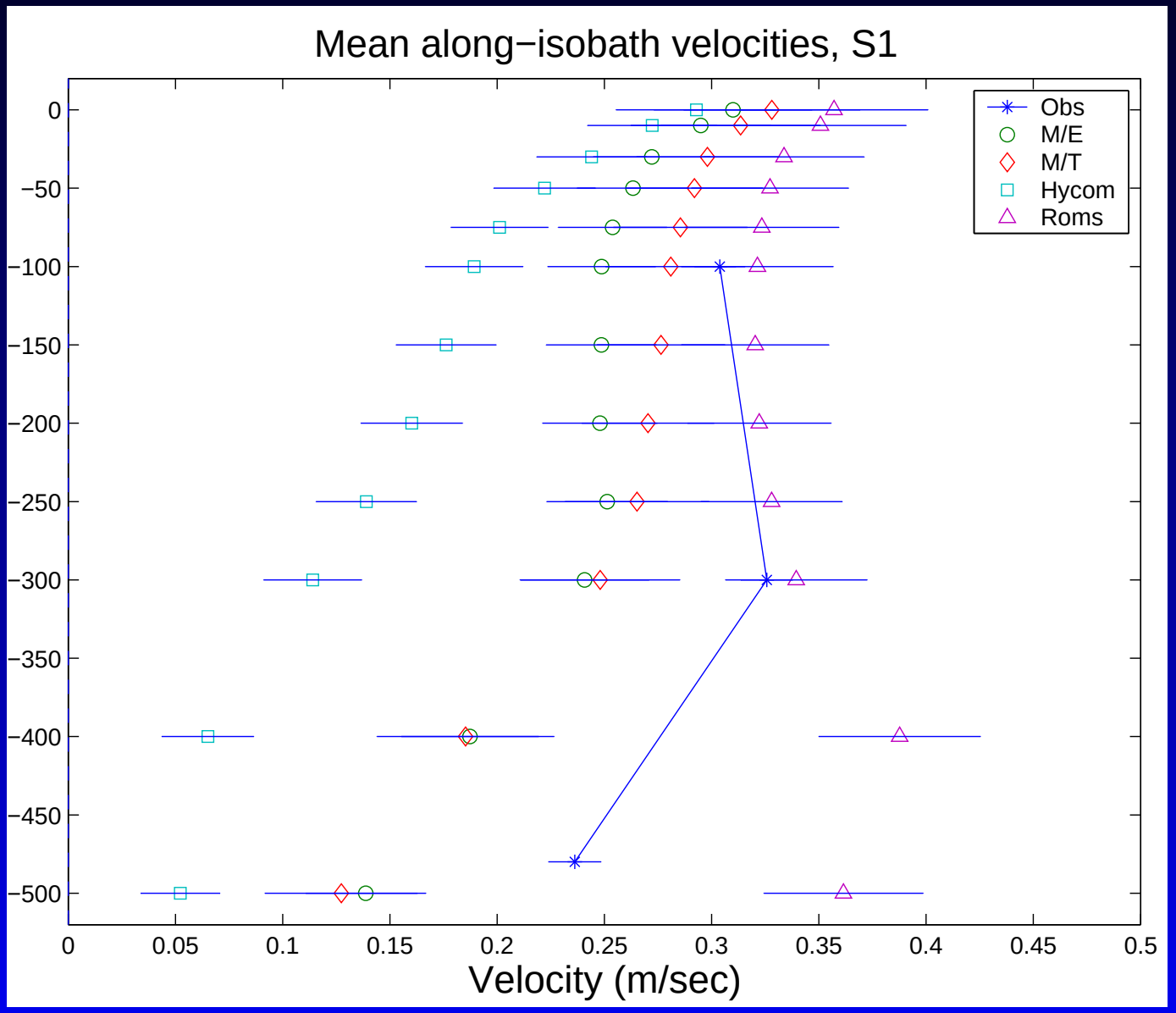
Speed: S1, 100 m



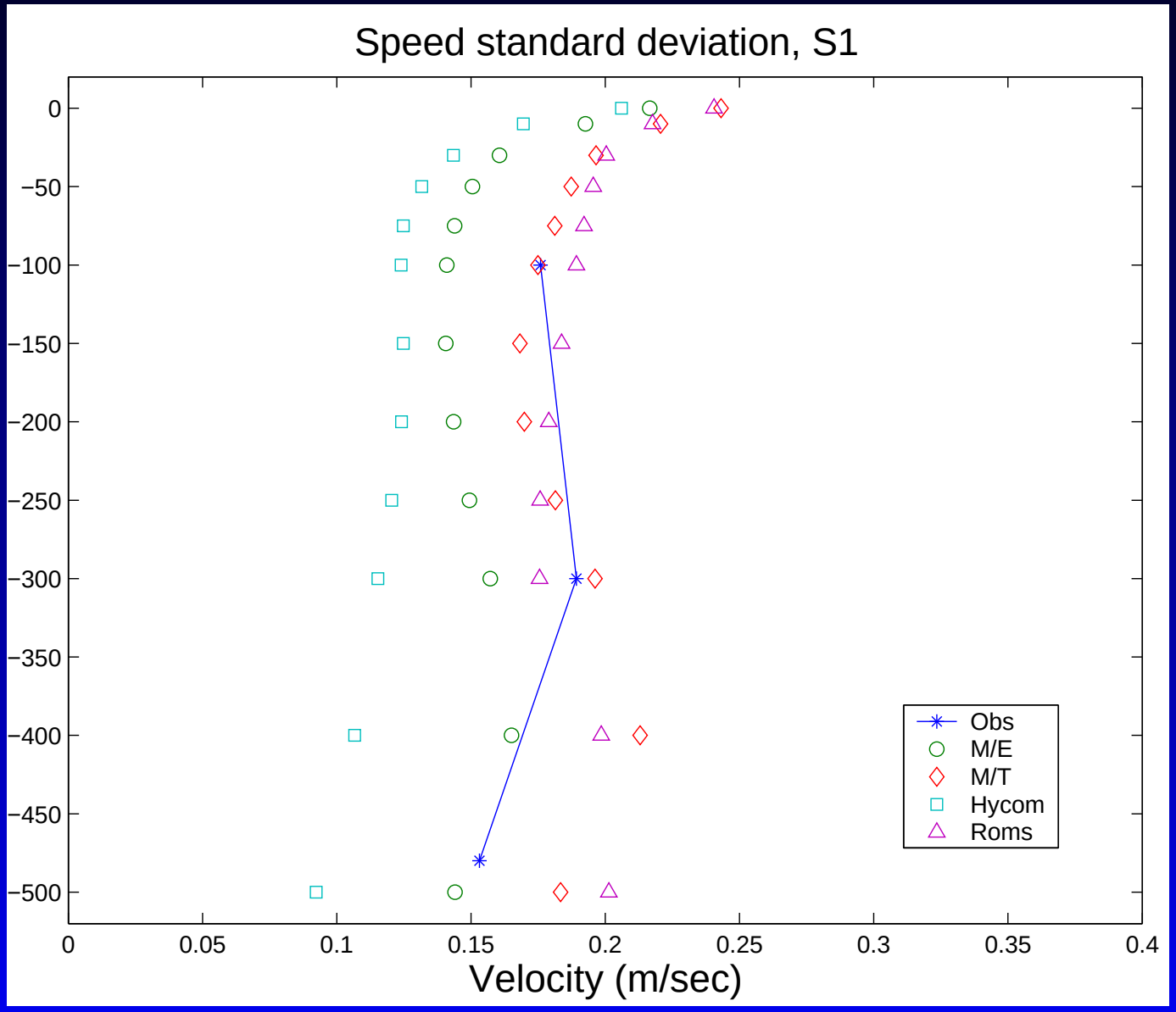
Speed: S1, 480 m



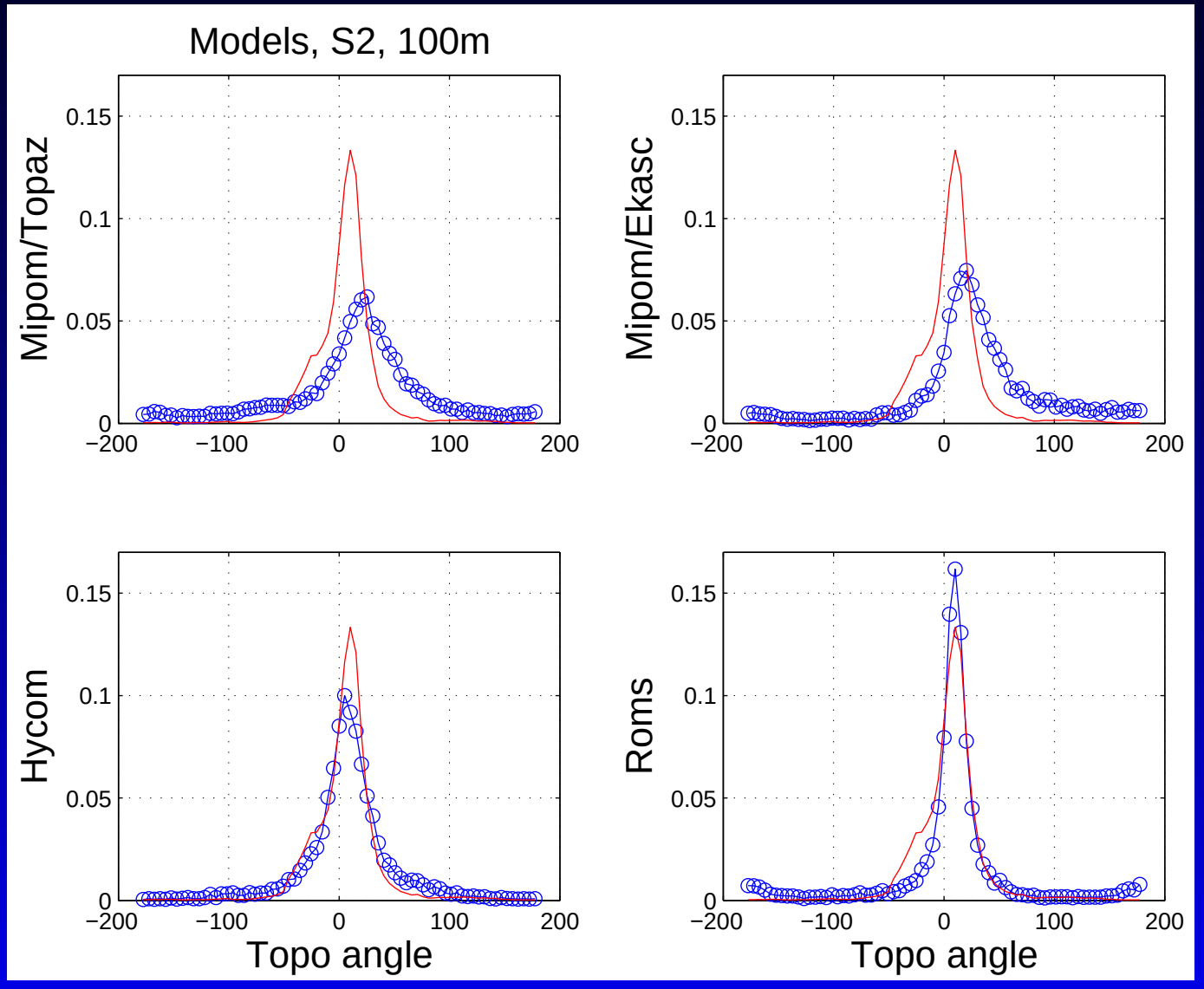
Means, S1


Mean along−isobath velocities, S1
Obs
M/E
M/T
Hycom
Roms
0
−50
−100
−150
−200
−250
−300
−350
−400
−450
−500
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
Velocity (m/sec)

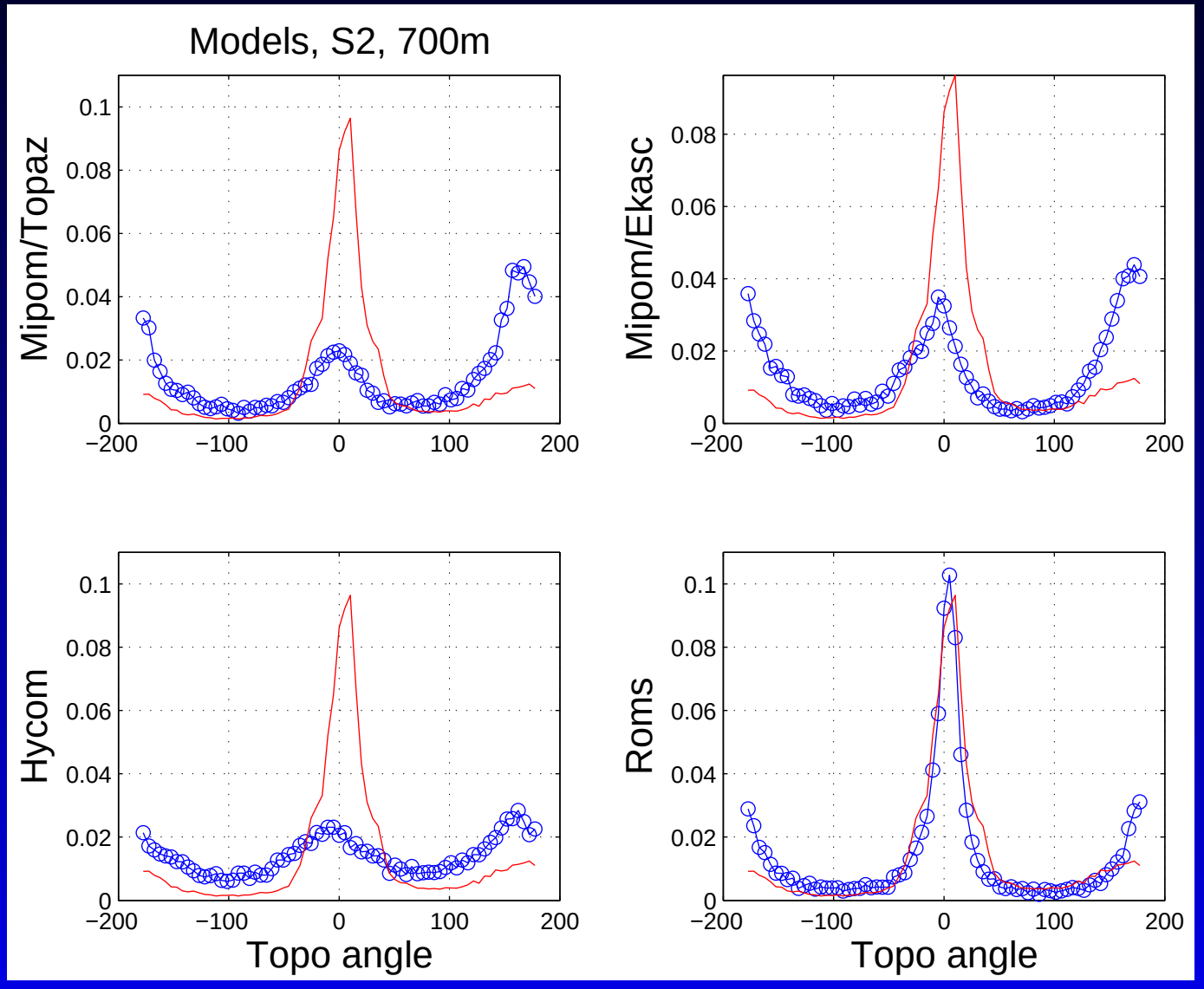
Deviations, s1



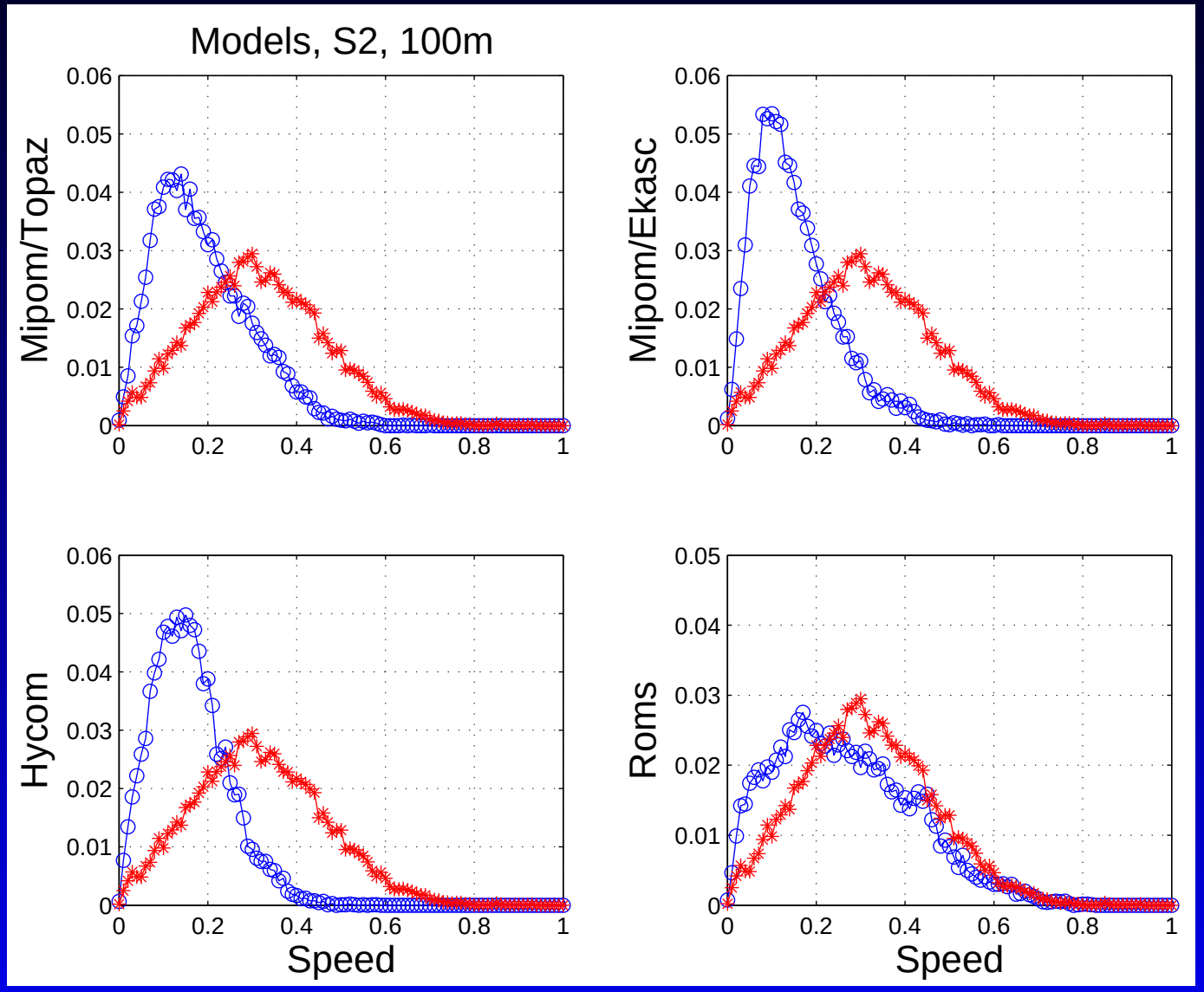
Topo Angle: S2, 100 m



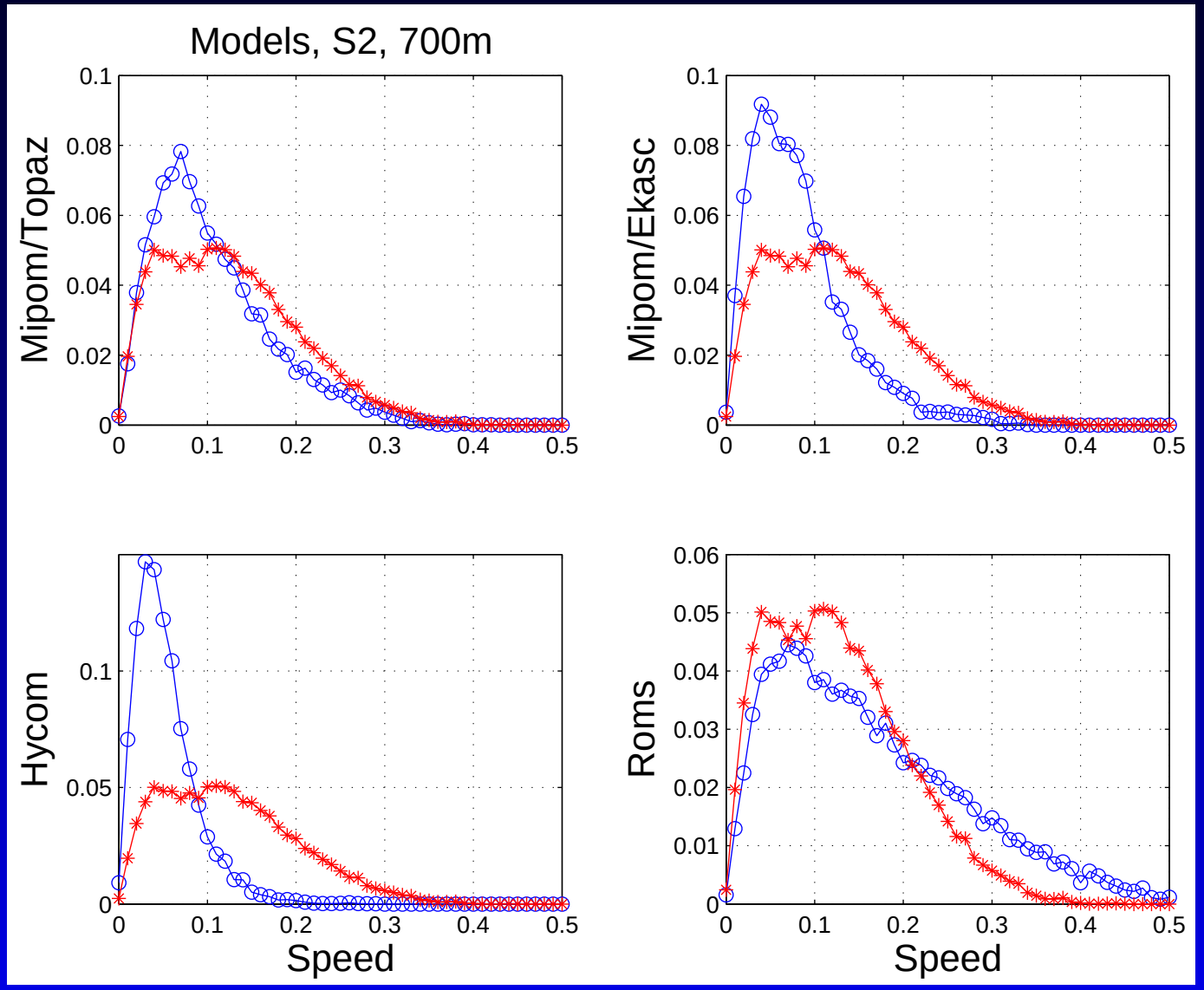
Topo Angle: S2, 700 m



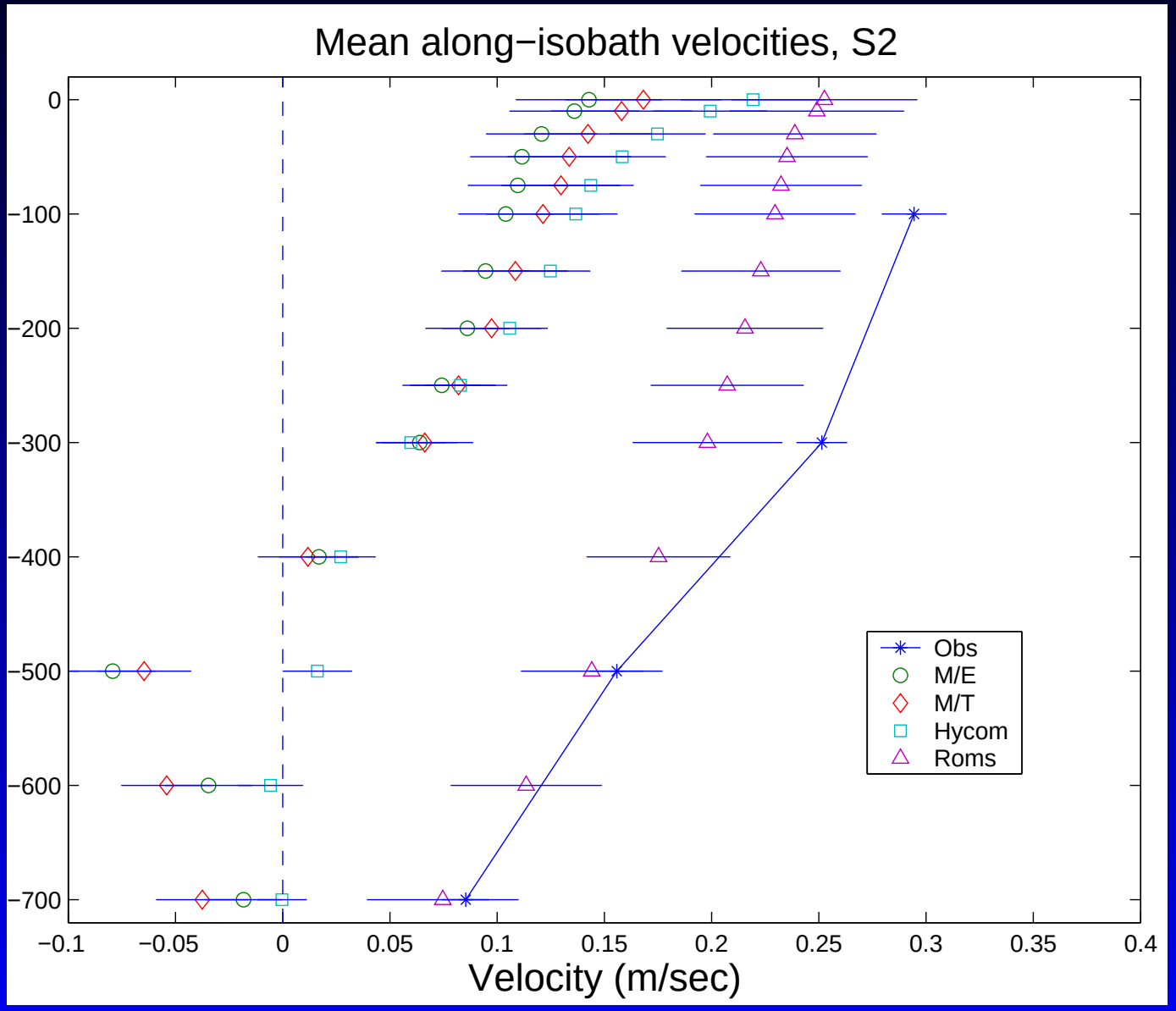
Speed: S2, 100 m



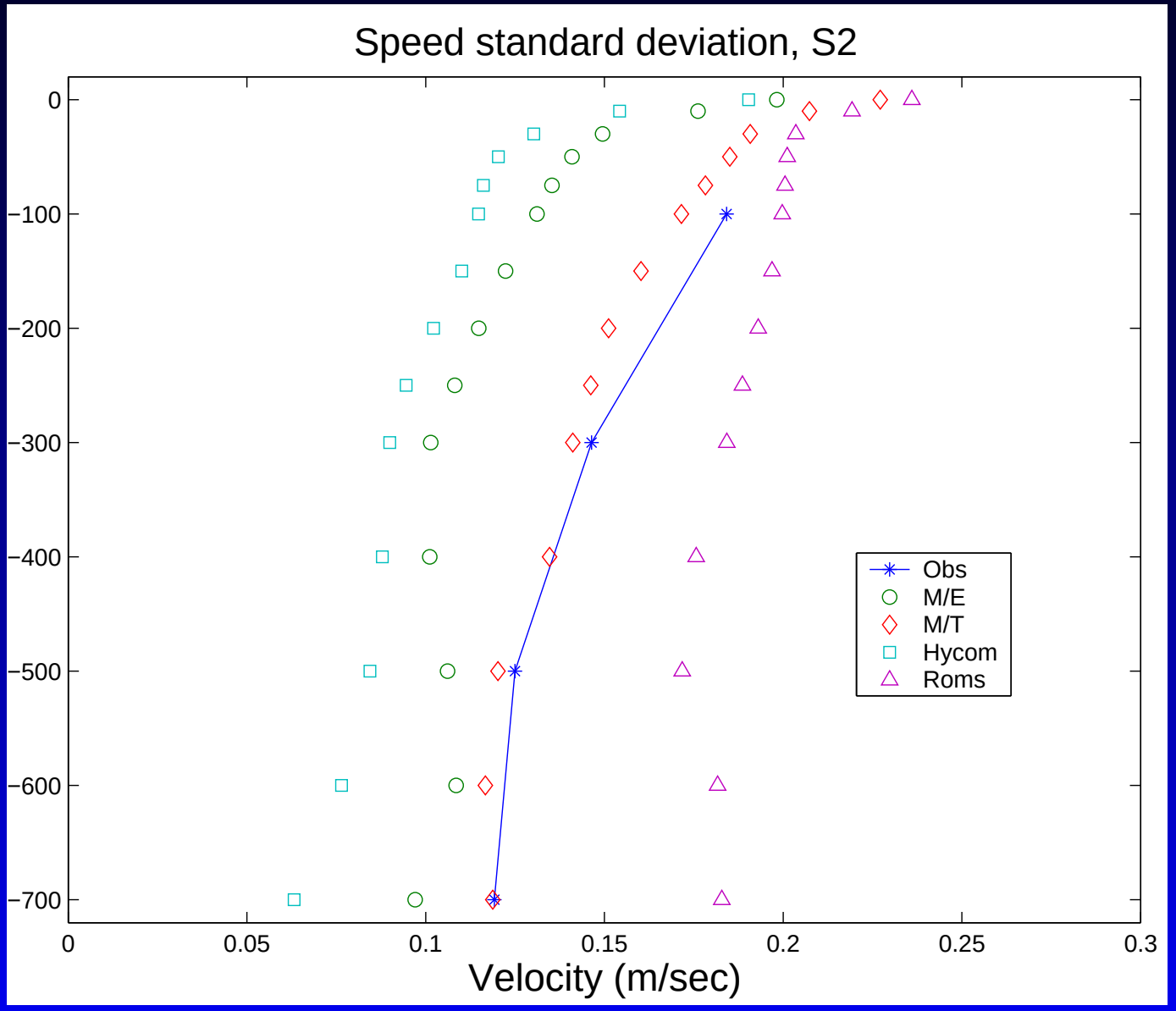
Speed: S2, 700 m



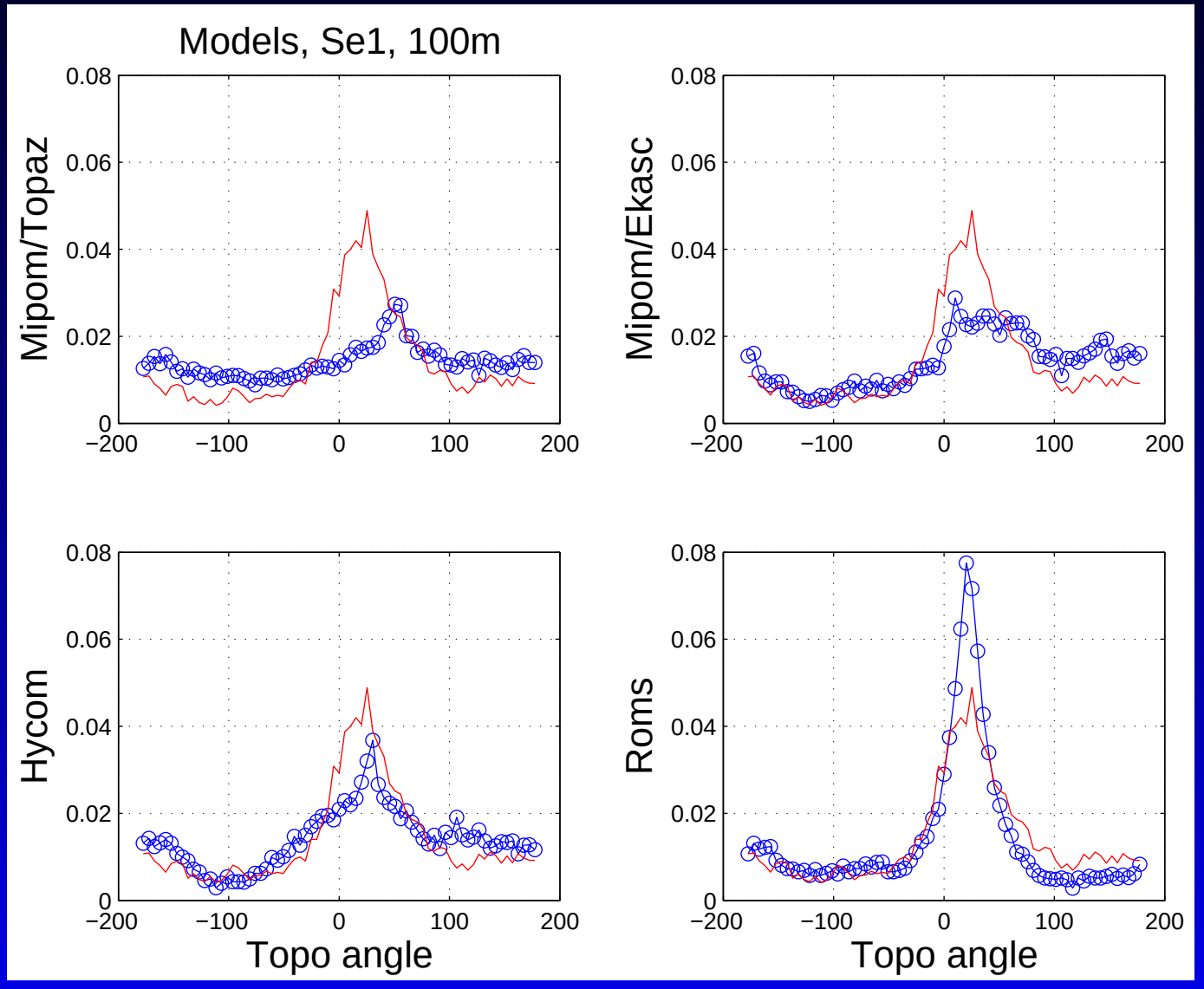
Means, S2


Mean along−isobath velocities, S2
0
−100
−200
−300
−400
−500
−600
−700
−0.1
−0.05
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
Velocity (m/sec)
Obs
M/E
M/T
Hycom
Roms

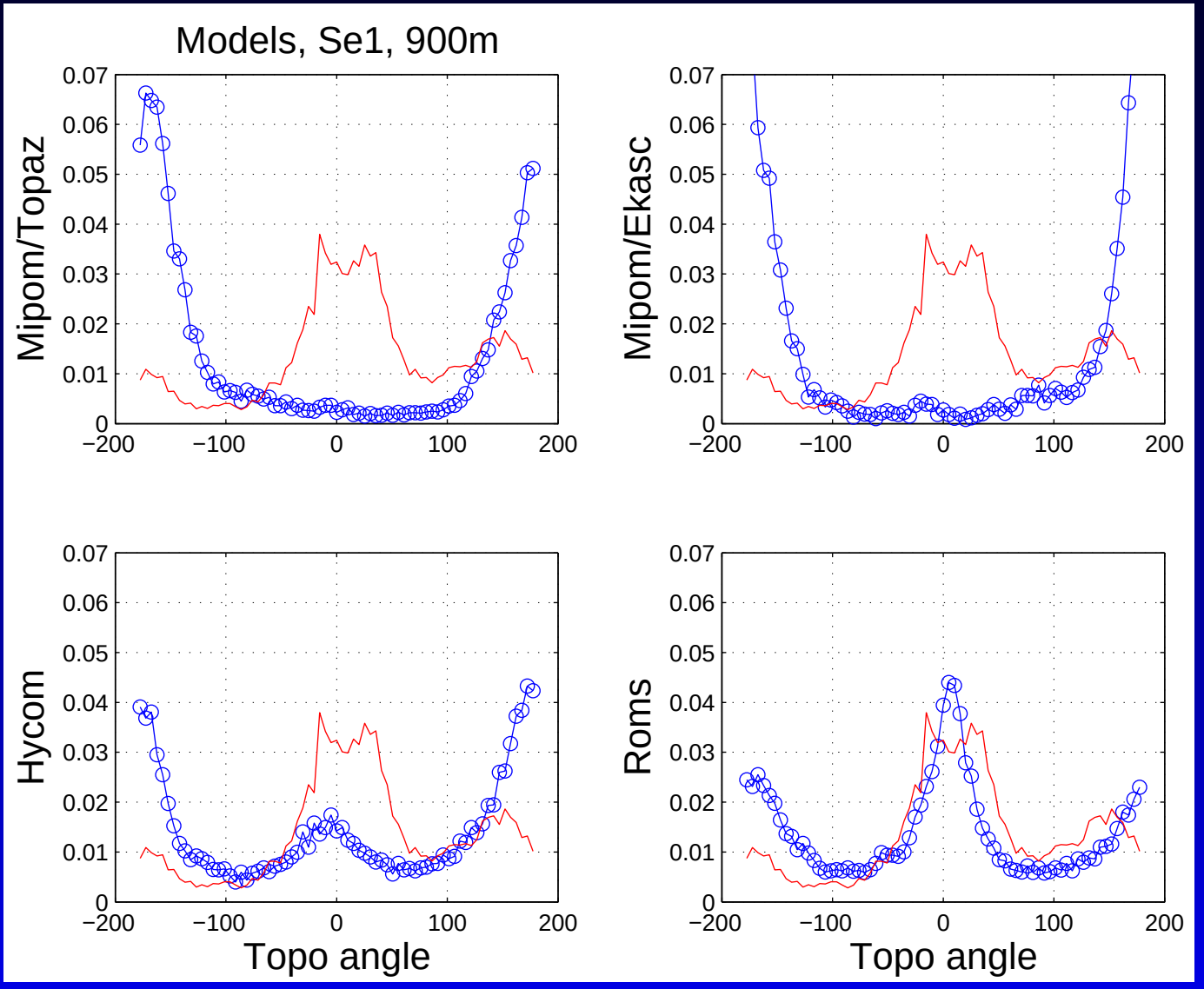
Deviations, S2



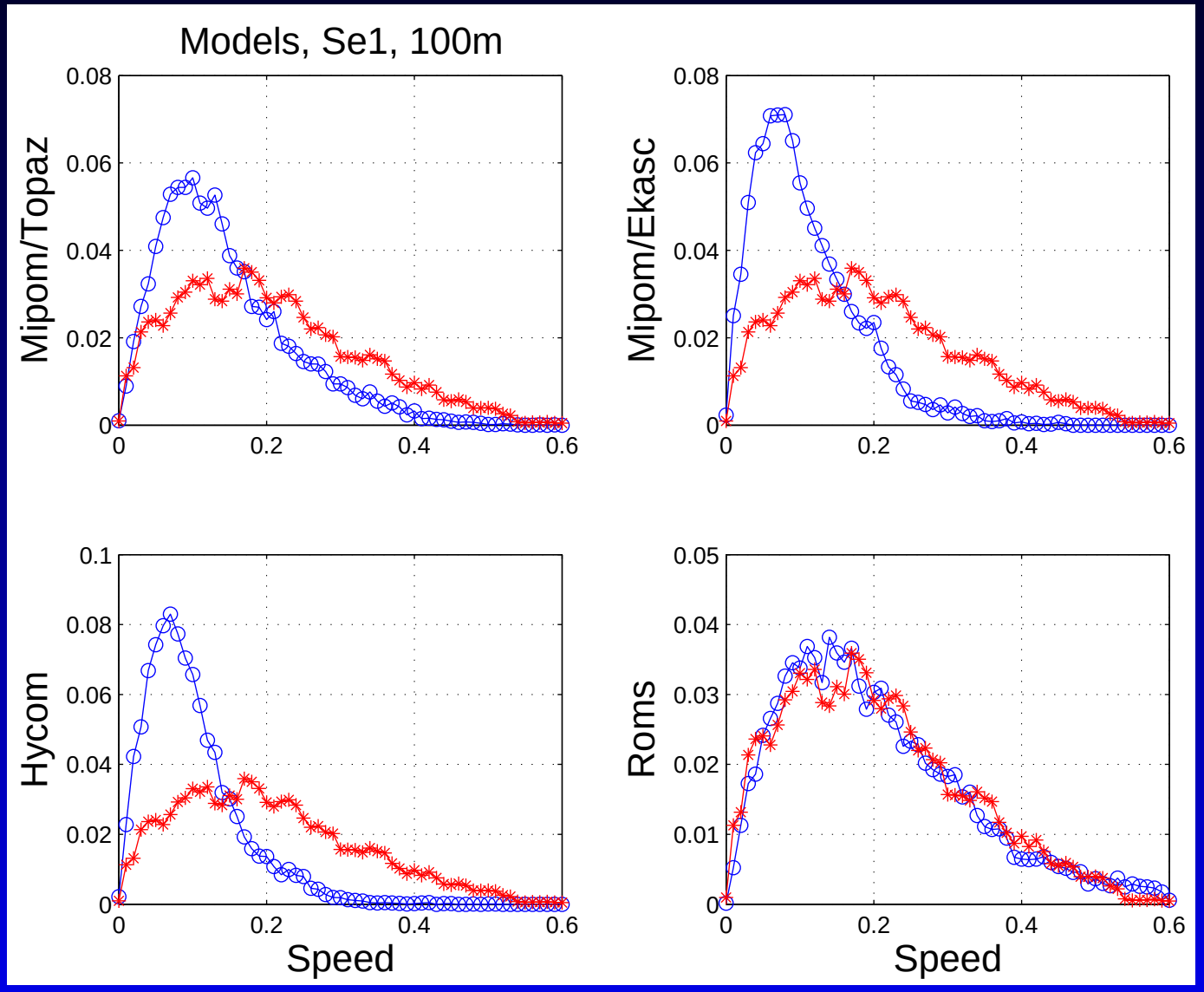
Topo Angle: Se1, 100 m



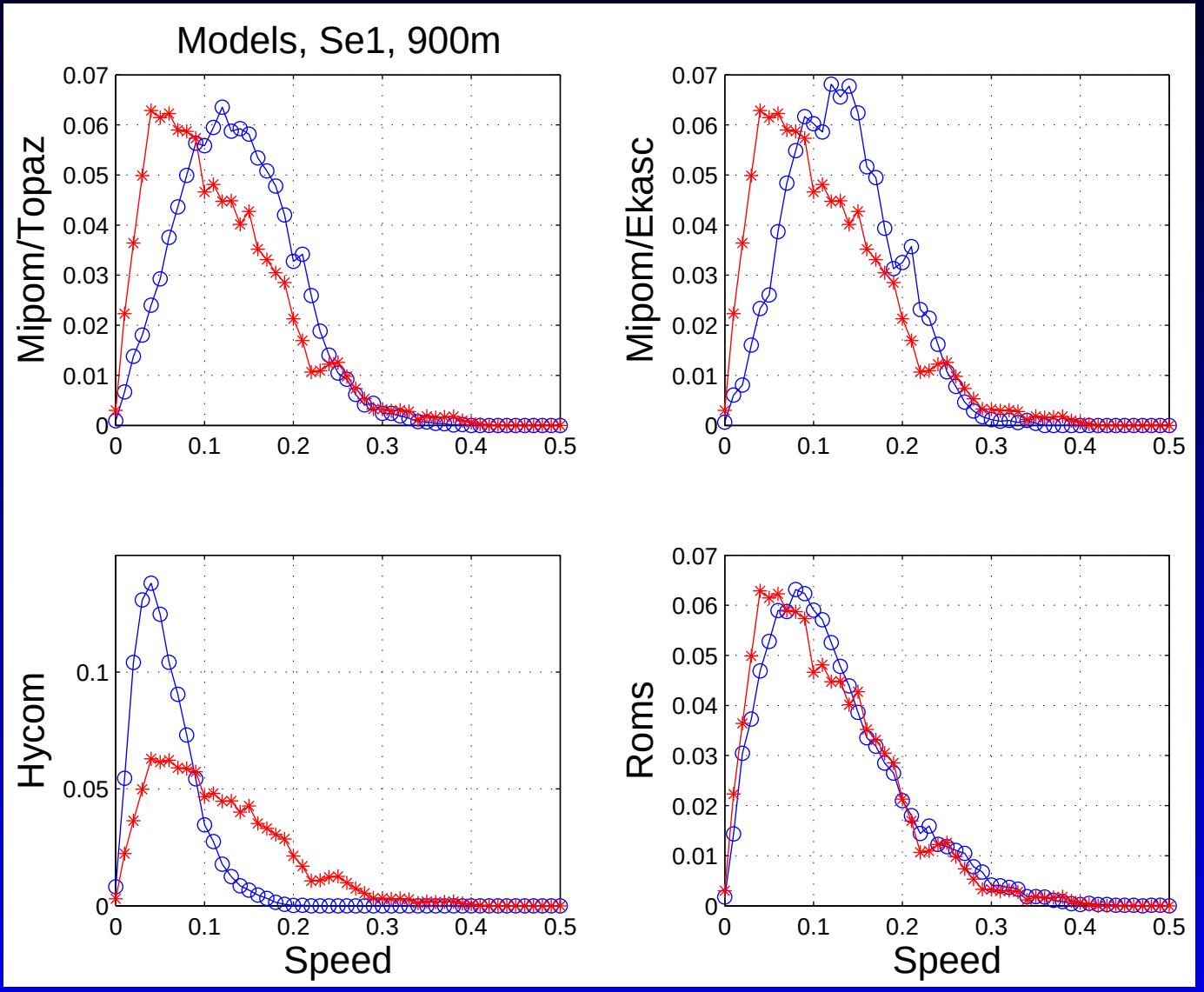
Topo Angle: Se1, 900 m



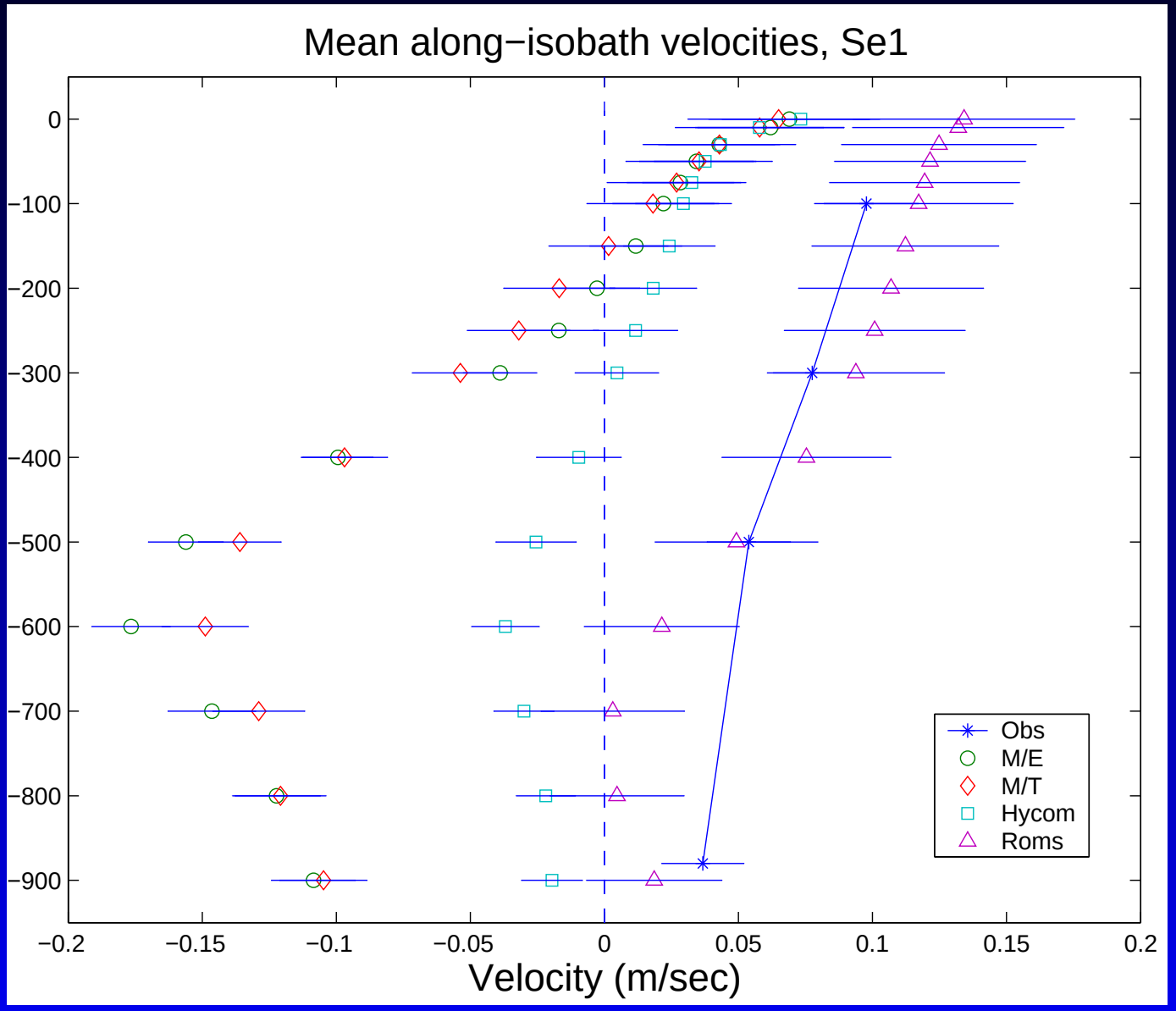
Speed: Se1, 100 m



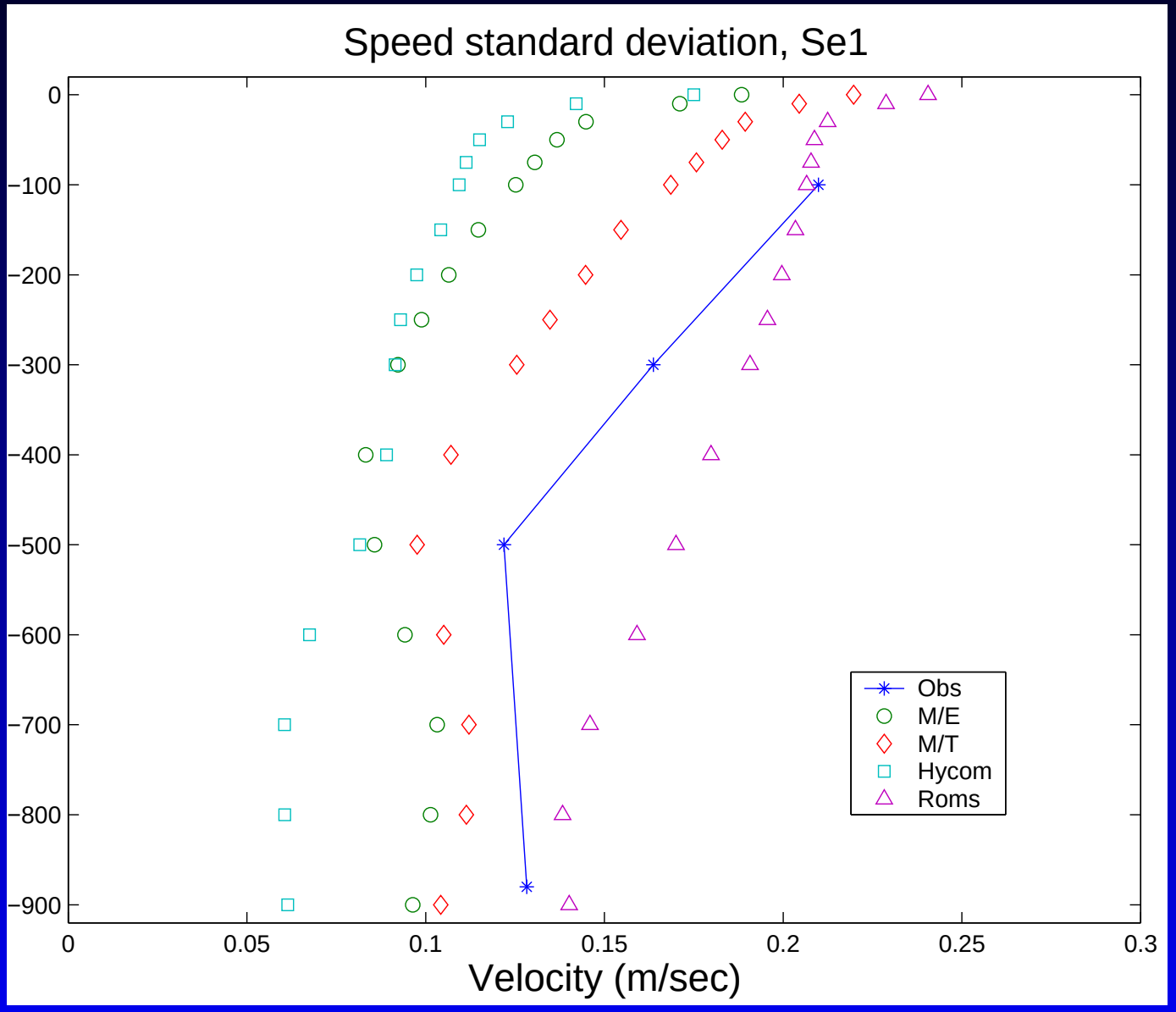
Speed: Se1, 900 m



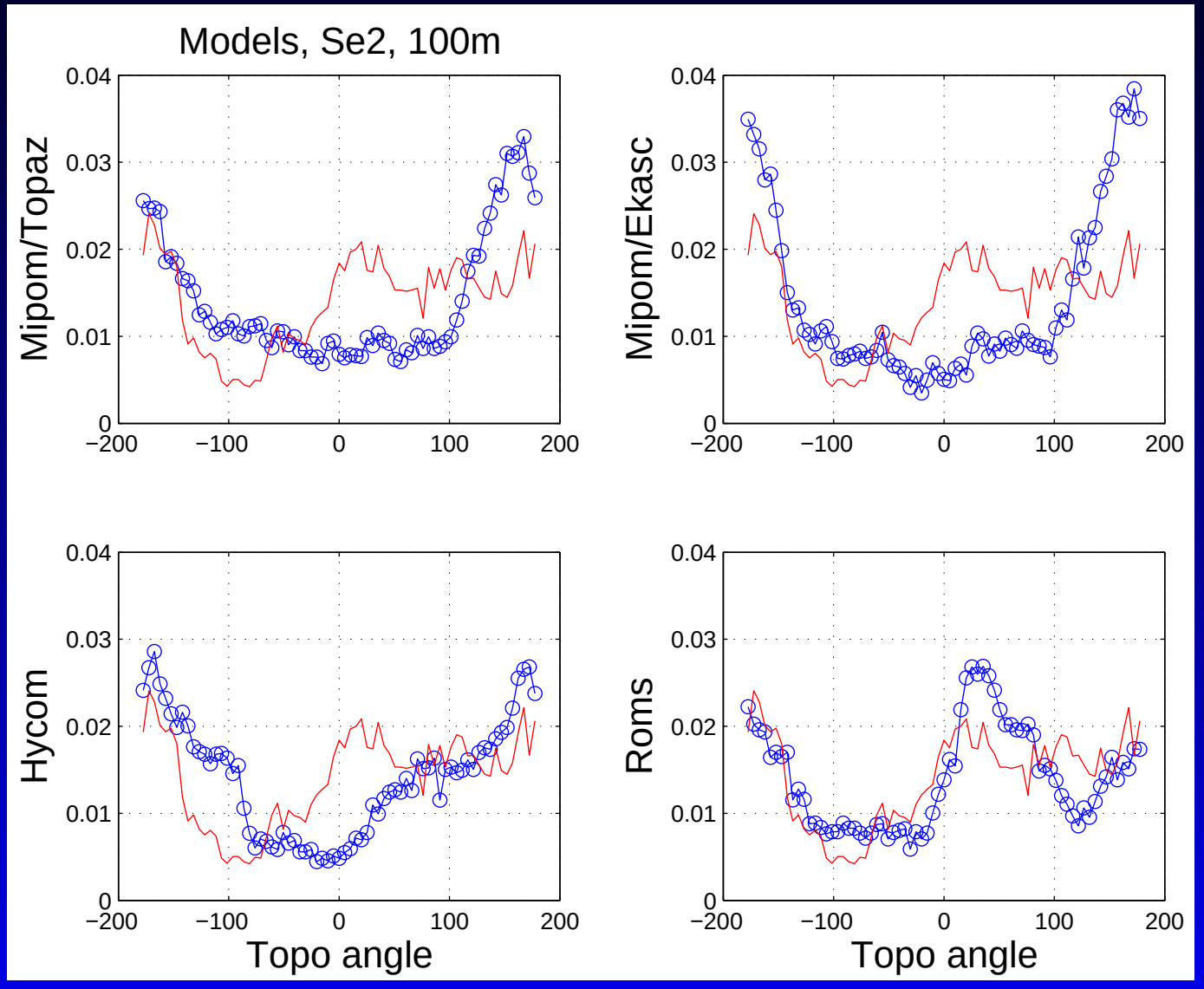
Means, Se1


Mean along−isobath velocities, Se1
0
−100
−200
−300
−400
−500
−600
−700
−800
−900
−0.2
−0.15
−0.1
−0.05
0
0.05
0.1
0.15
0.2
Velocity (m/sec)
Obs
M/E
M/T
Hycom
Roms

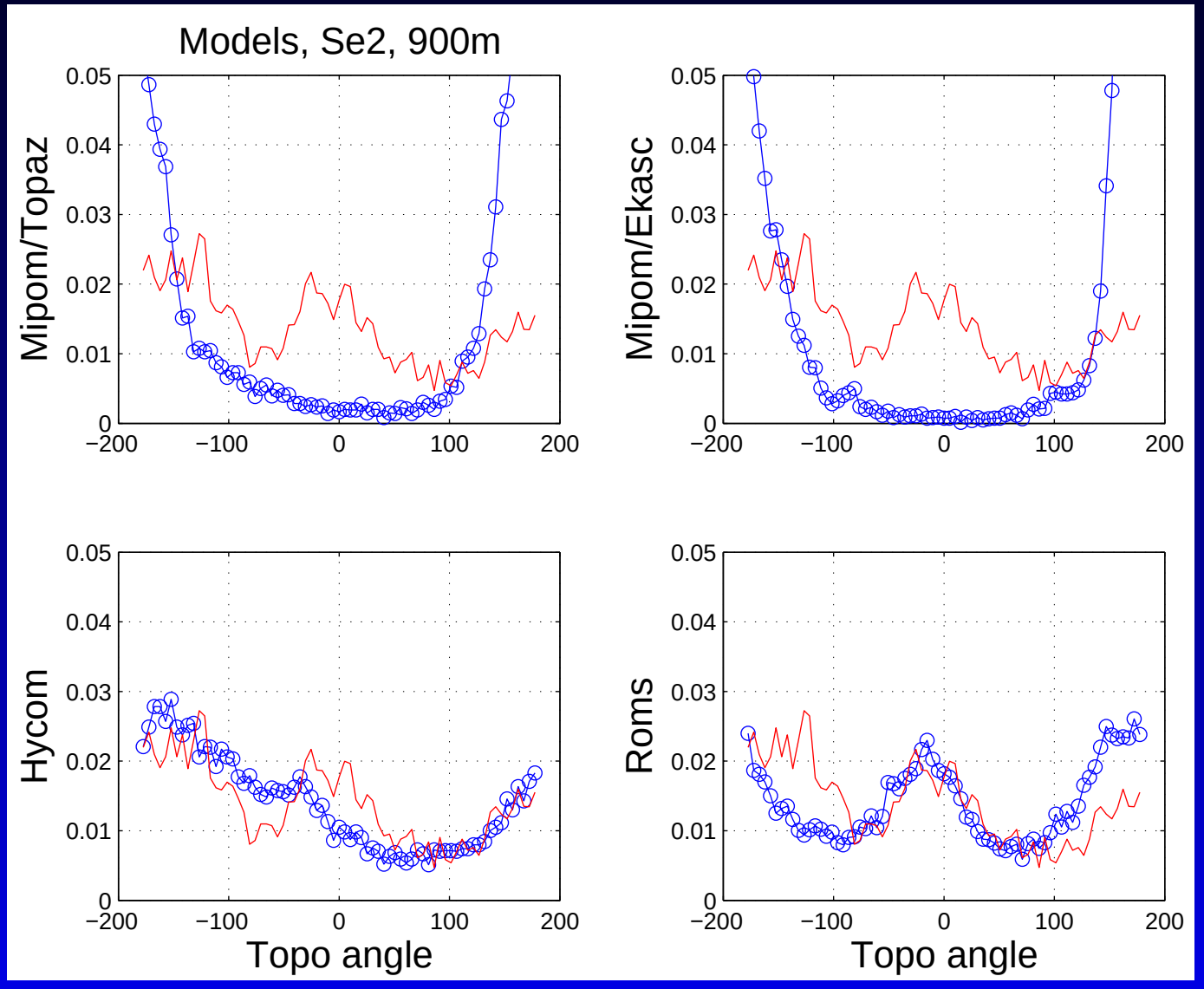
Deviations, Se1



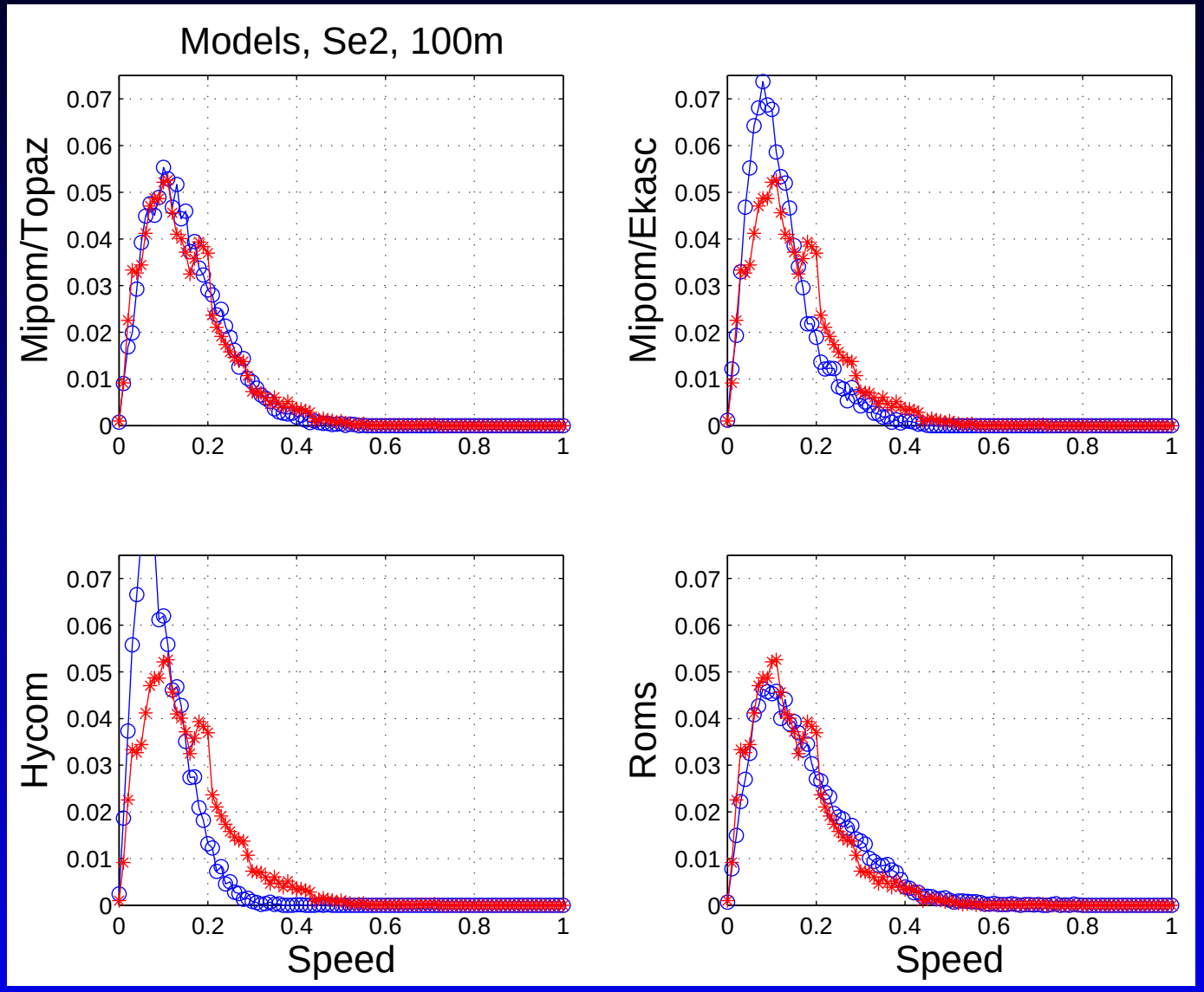
Topo Angle: Se2, 100 m



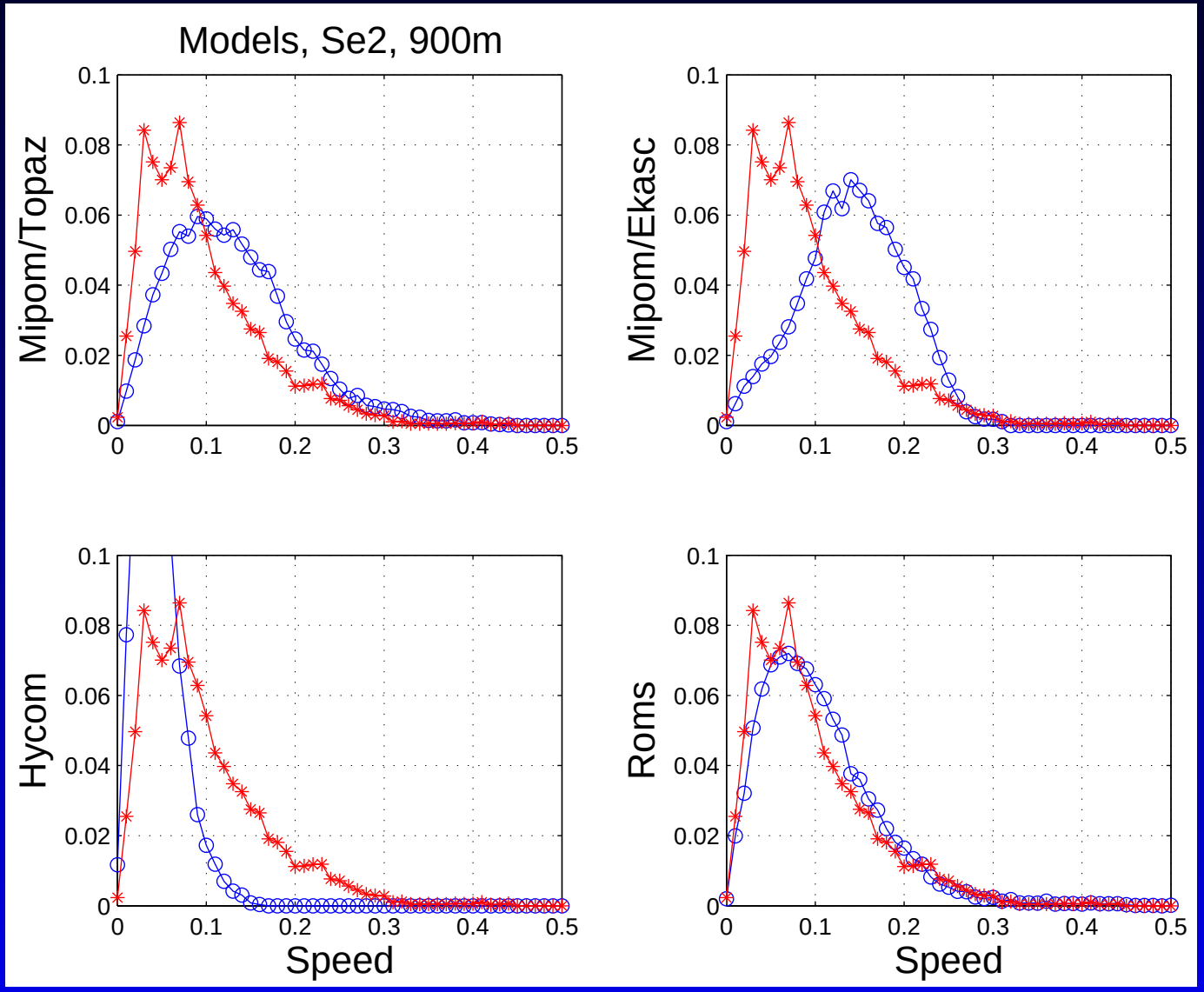
Topo Angle: Se2, 900 m



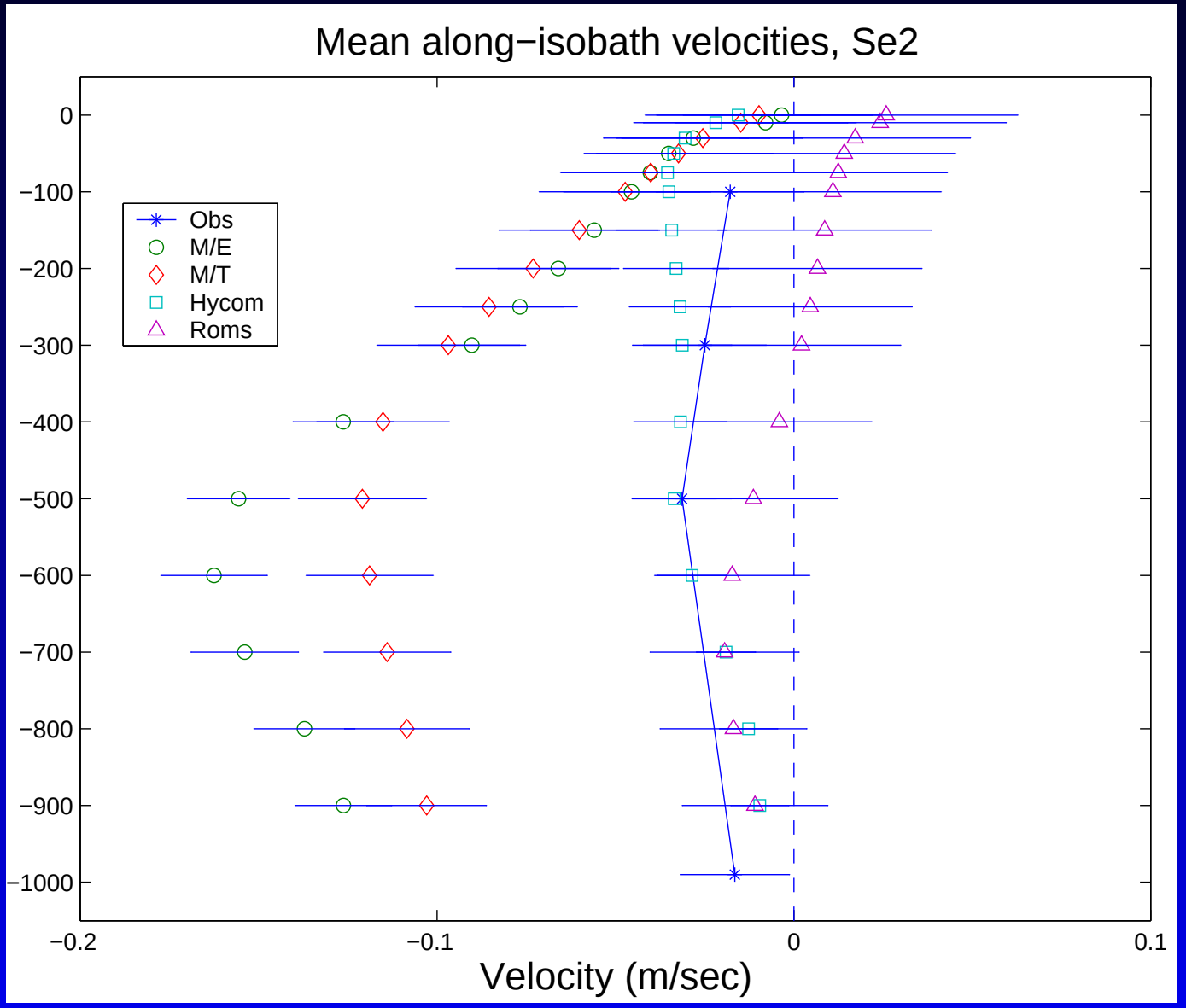
Speed: Se2, 100 m



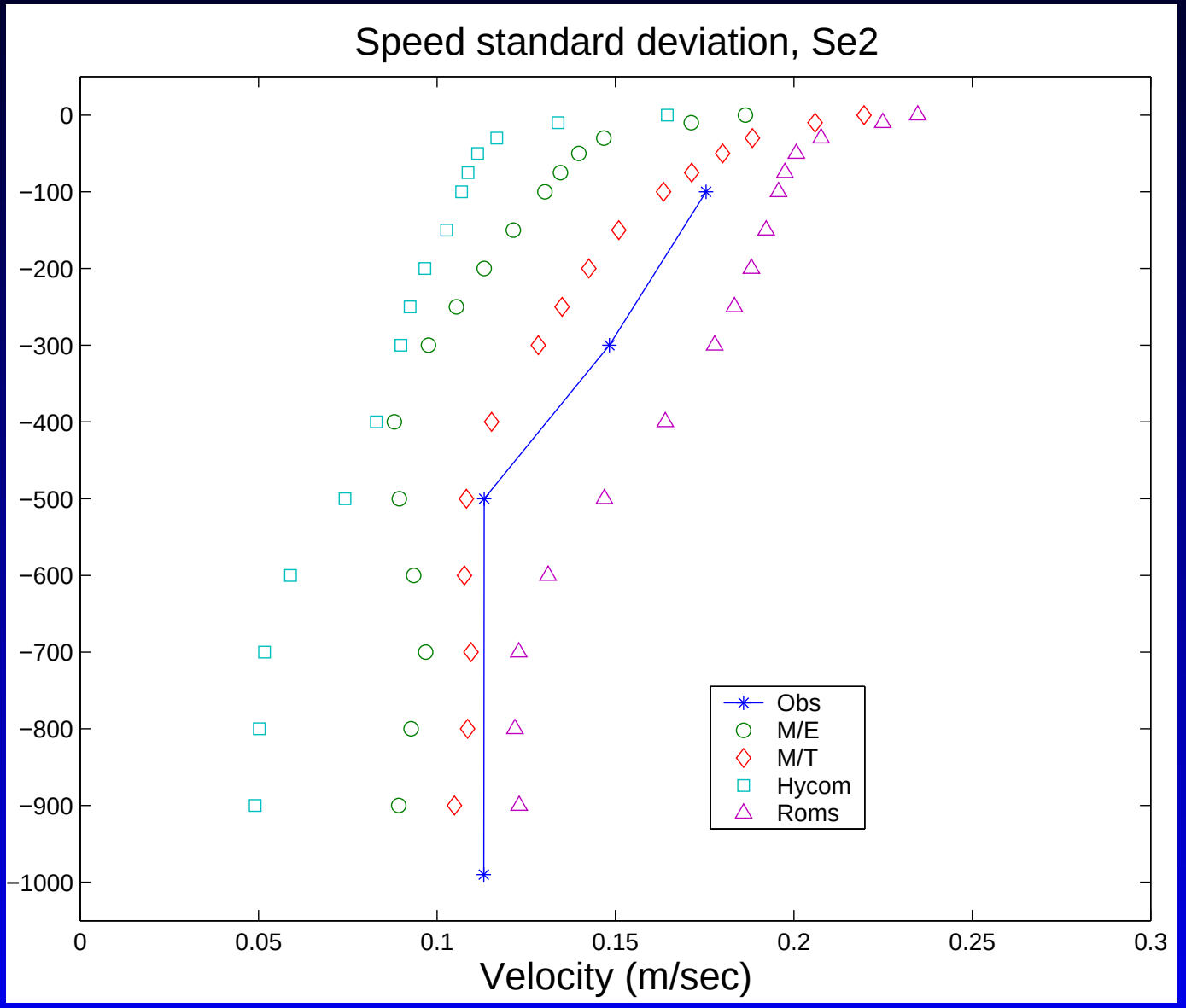
Speed: Se2, 900 m



Means, Se2


Mean along−isobath velocities, Se2
Obs
M/E
M/T
Hycom
Roms
0
−100
−200
−300
−400
−500
−600
−700
−800
−900
−1000
−0.2
−0.1
0
0.1
Velocity (m/sec)

Deviations, Se2



Summary

1) Means

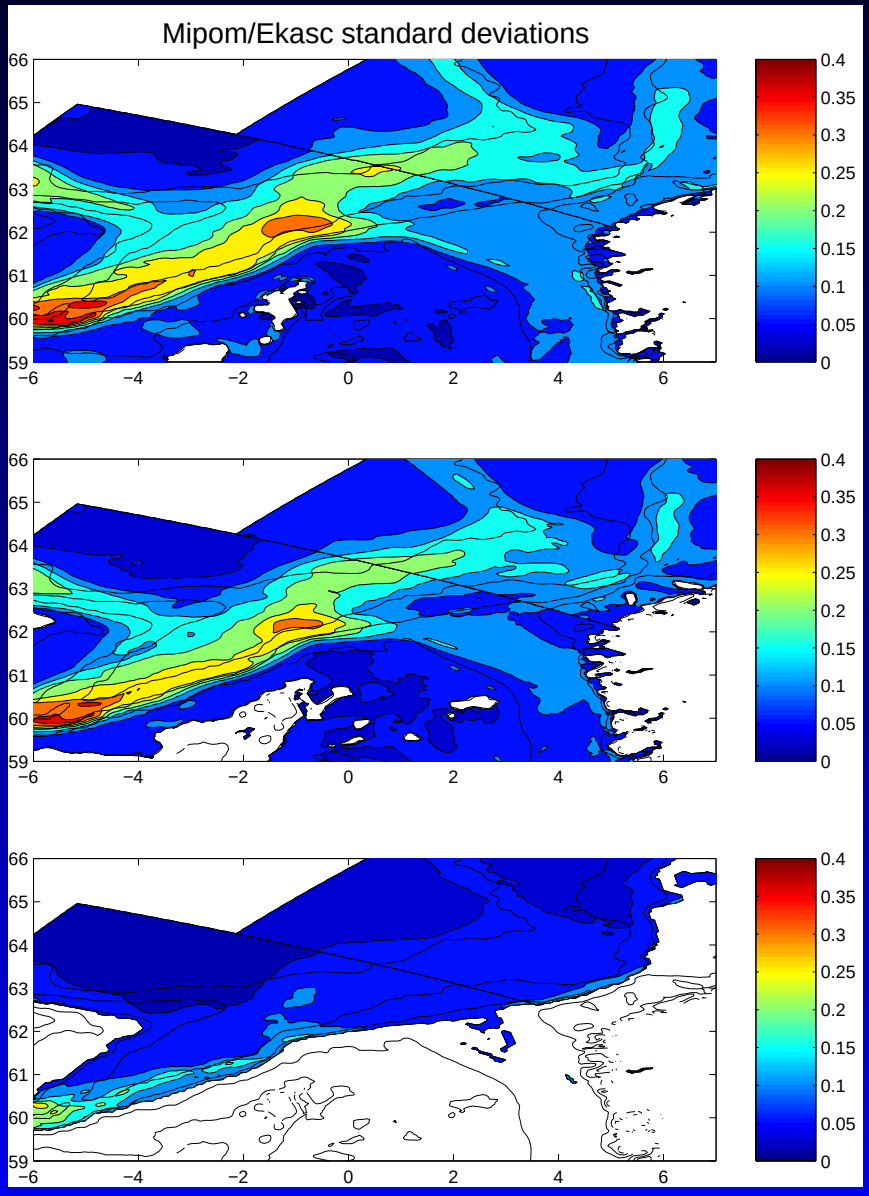
- Models are similar in large scale structure
- ROMS is most energetic
- MIPOM and HYCOM detour into North Sea, while ROMS bifurcates
- MIPOM and HYCOM have an equatorward undercurrent, while ROMS has poleward flow

Summary

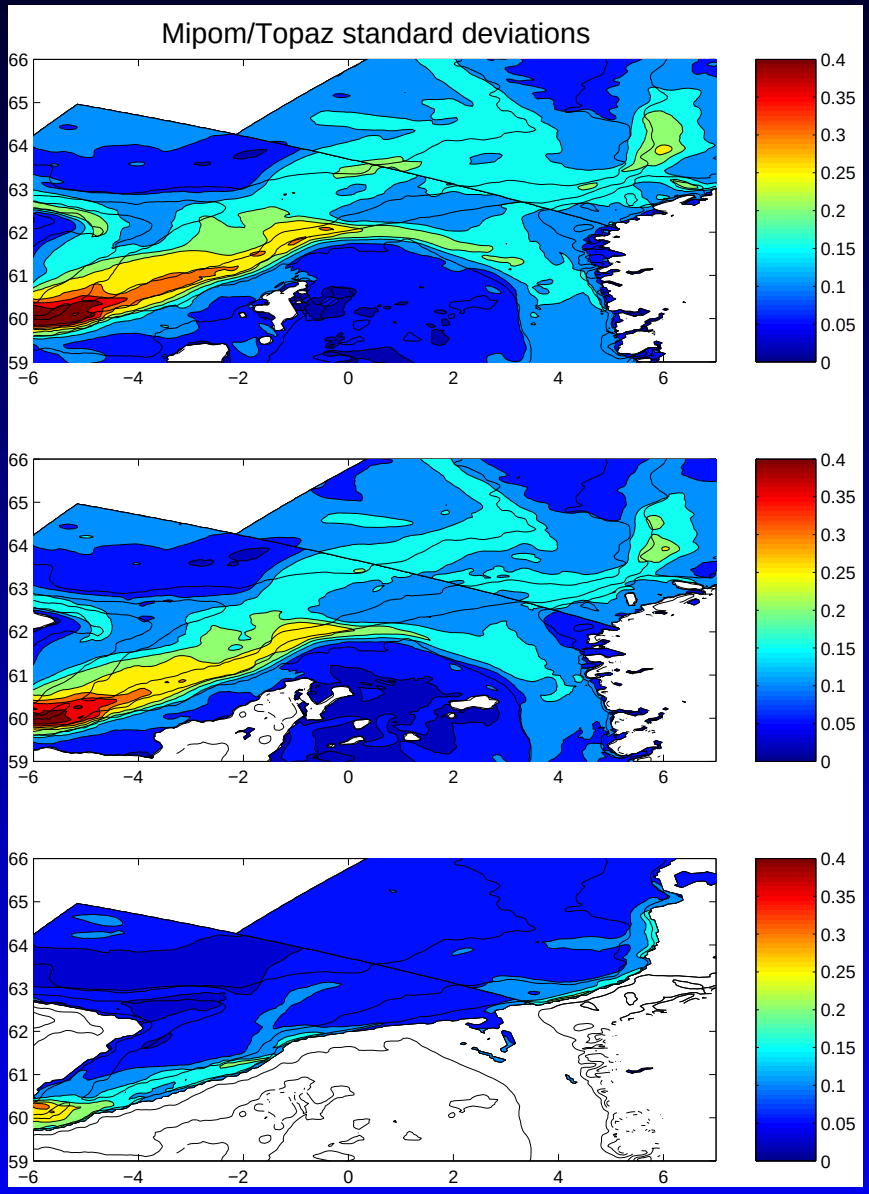
2) Deviations

- ROMS is most energetic, HYCOM the least
- ROMS has velocity PDFs nearest to observed
- ROMS deviations somewhat too large on slope

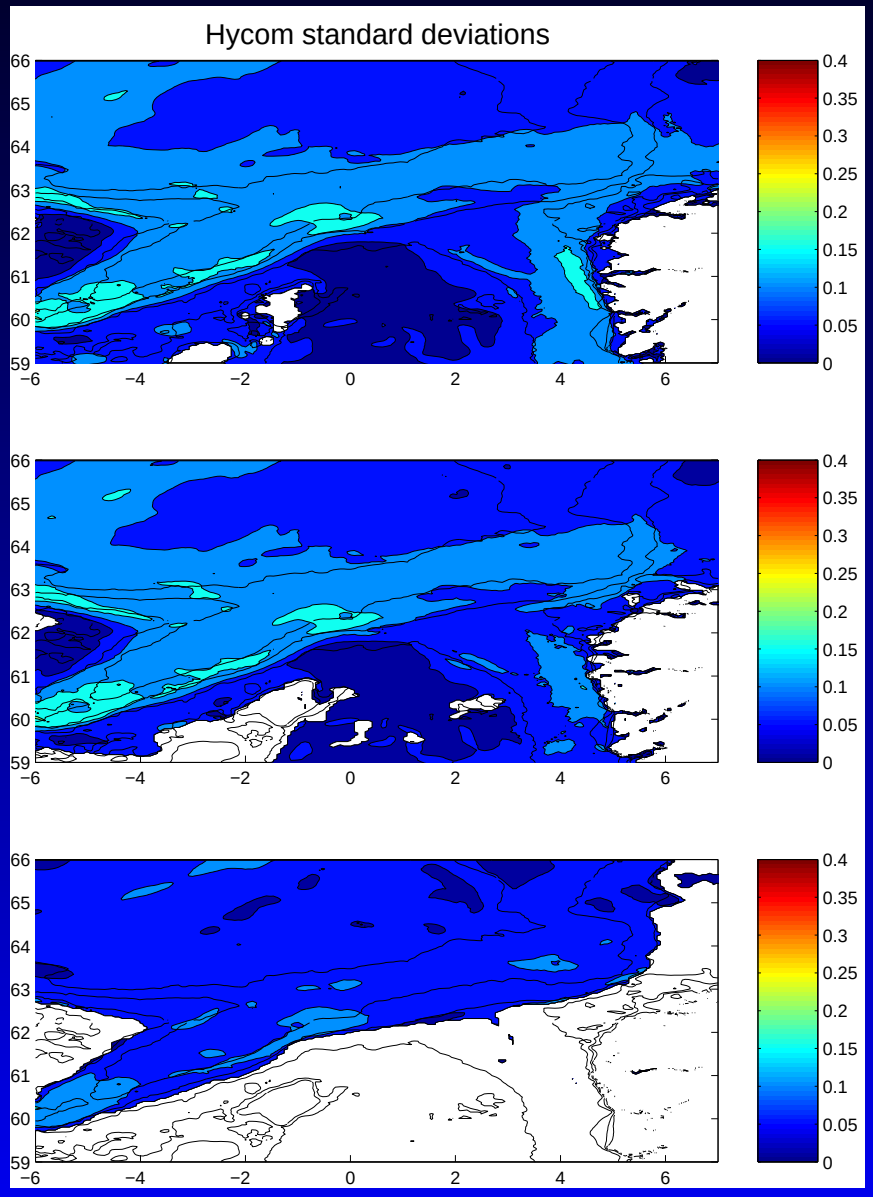
M/E: 50, 100, 400 m



M/T: 50, 100, 400 m



HYCOM: 50, 100, 400 m



ROMS: 50, 100, 400 m