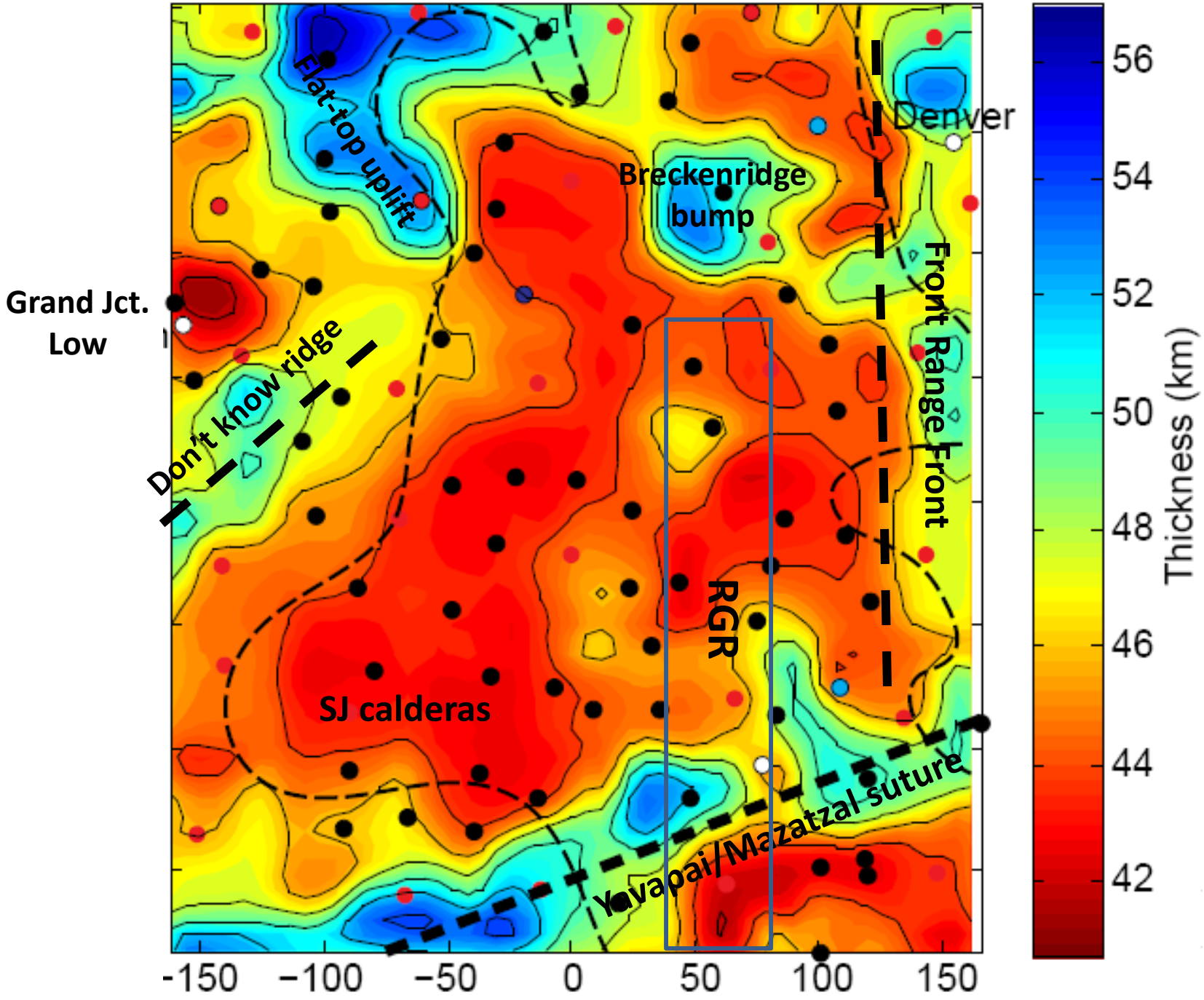
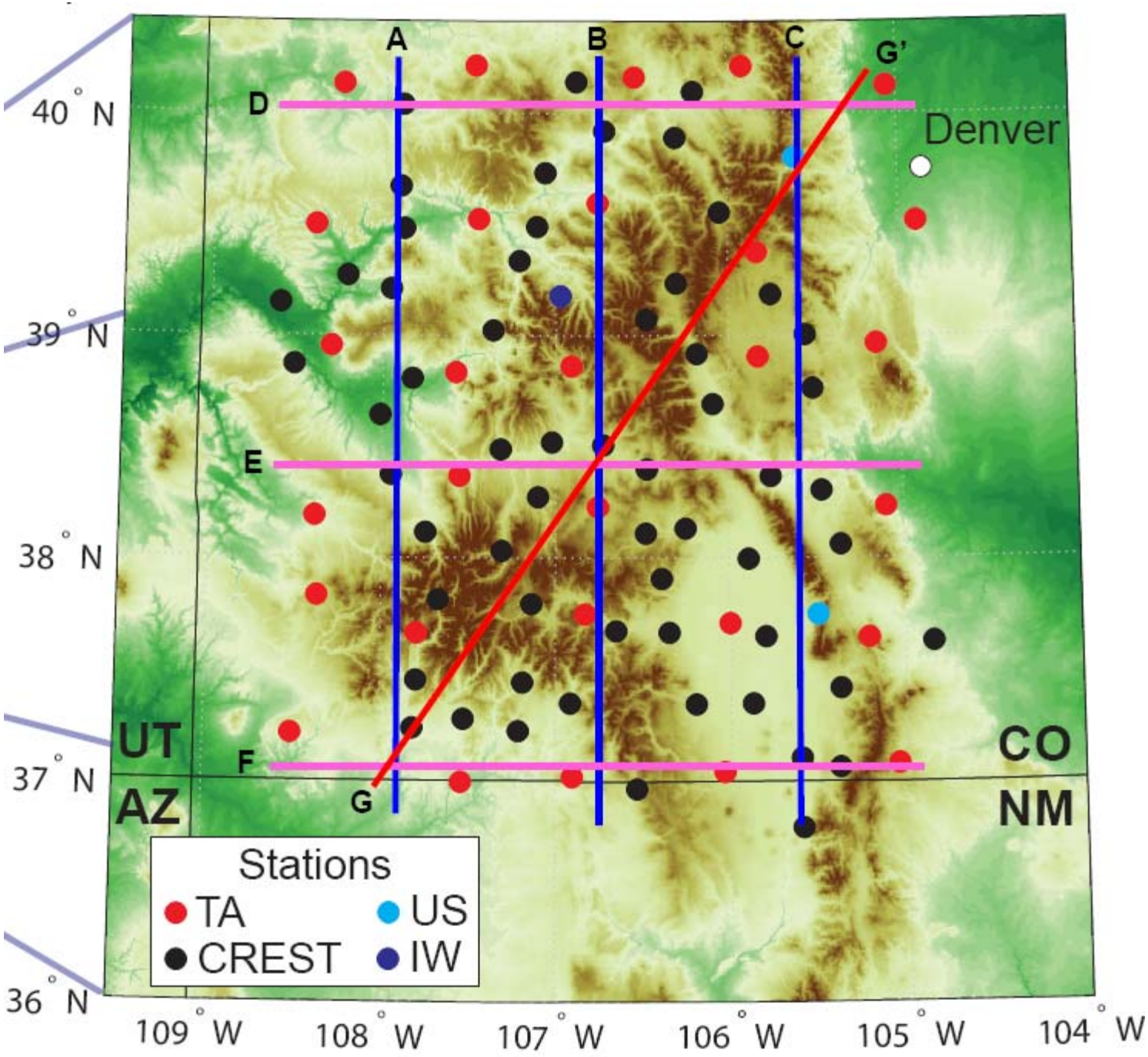
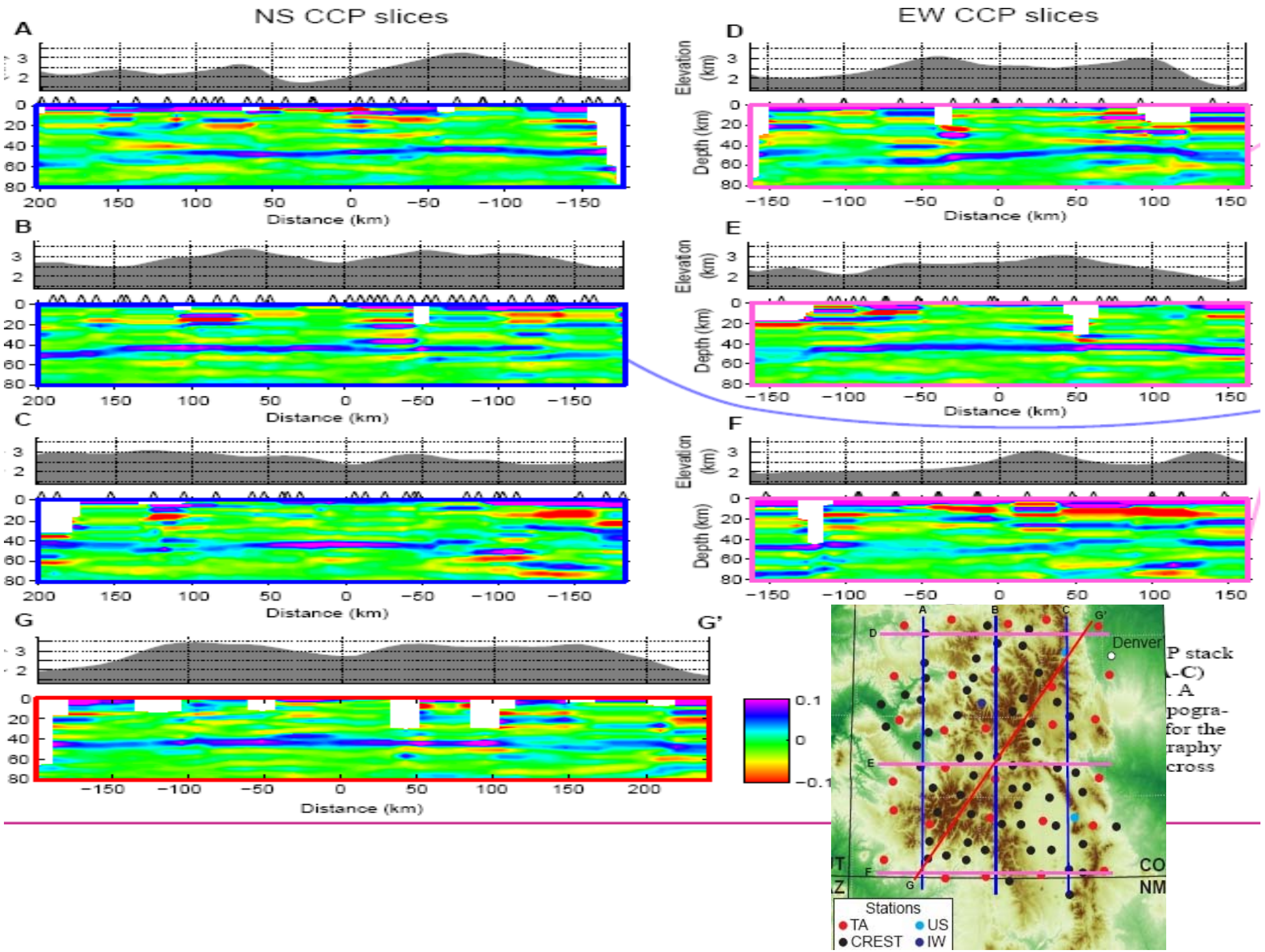
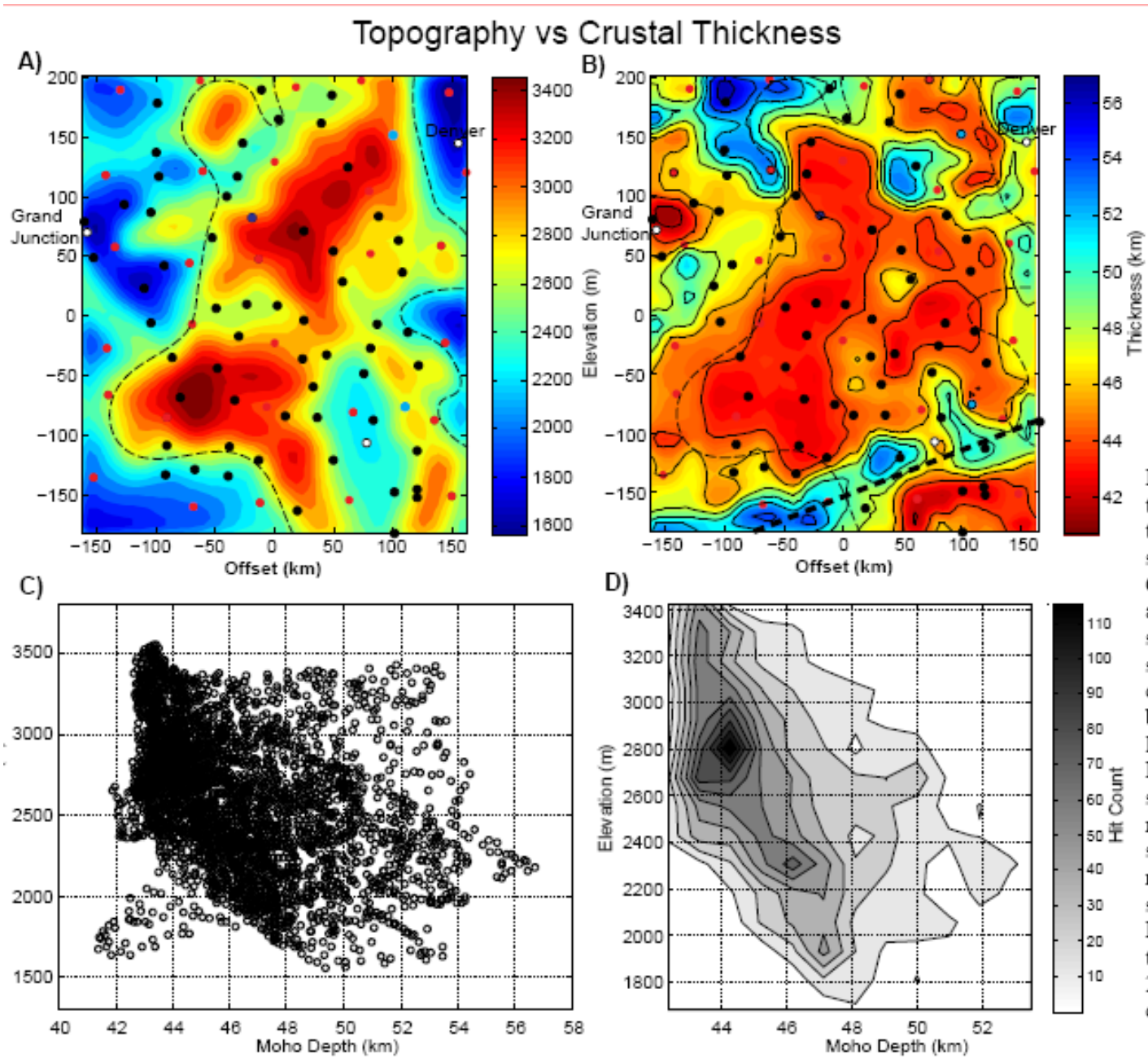

Grand Jct.
Low
Flat-top uplift
Breckenridge
bump
Denver
Front Range Front
Don't know ridge
RGR
SJ calderas
Yavapai/Mazatzal suture
-150
−100
−50
0
50
100
150
56
54
52
50
48
46
44
42
Thickness (km)


A
B
C
D
E
F
G
G'
Denver
40 ° N
39 ° N
38 ° N
37 ° N
36 ° N
109 ° W
108 ° W
107 ° W
106 ° W
105 ° W
104 ° W
UT
AZ
CO
NM
Stations
TA
US
CREST
IW



P stack
-C)
. A
pogra-
for the
raphy
cross



- elevation and crustal thickness are anti-correlated

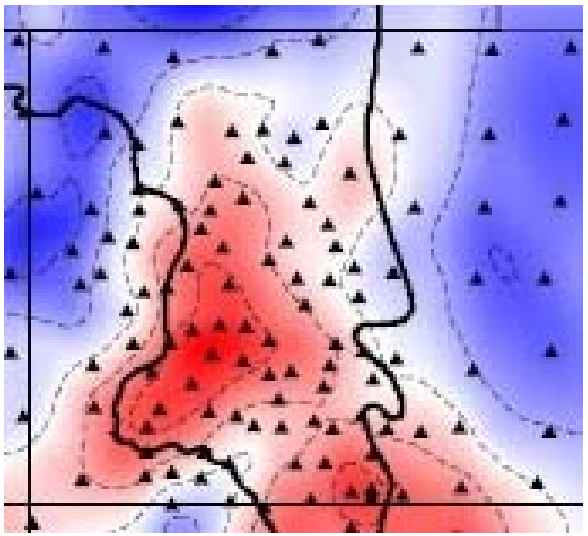
- correlation coefficient: **-0.37**

Figure 7. Relationship between topography and crustal thickness. **A)** shows the smoothed topography for the CREST array, CREST stations are shown by black dots, TA stations by red dots and US stations are shown by blue dots. Major cities are denoted by white dots. Thin dashed lines outline the Colorado Rockies. **B)** shows the smoothed crustal thickness map derived from the CCP stack. Thick dashed line denotes a possible proterozoic suture. **C)** is a scatter plot of Moho depth vs elevation for the data in A) and B). **D)** is a 2-D histogram of the scatter data in C).

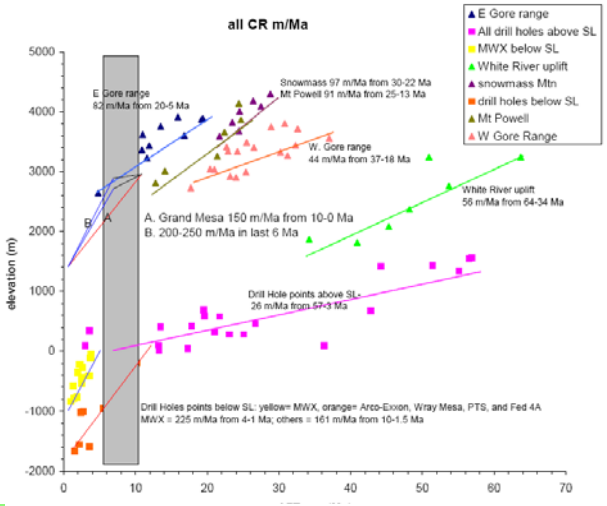
Sources of Buoyancy to support the Rockies

Crust thinnest (46-48 km) under the Colorado Dome. Topographic support by low velocity/density crust, isostatic mantle, and mantle flow pressures.

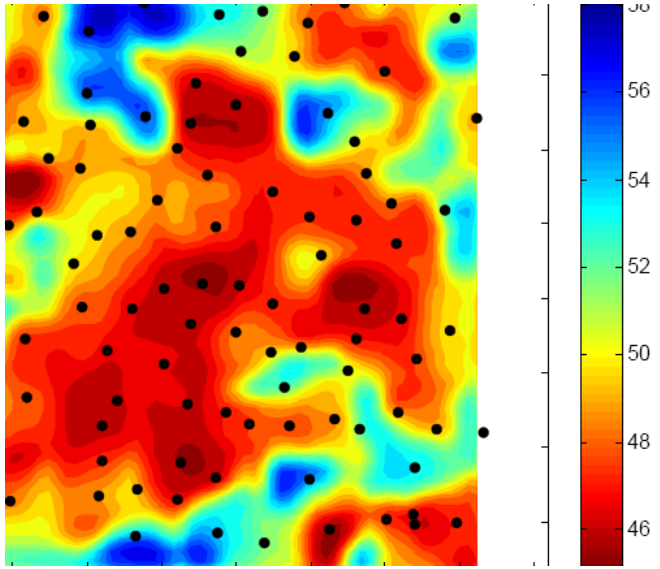
S-wave tomogram 125 km



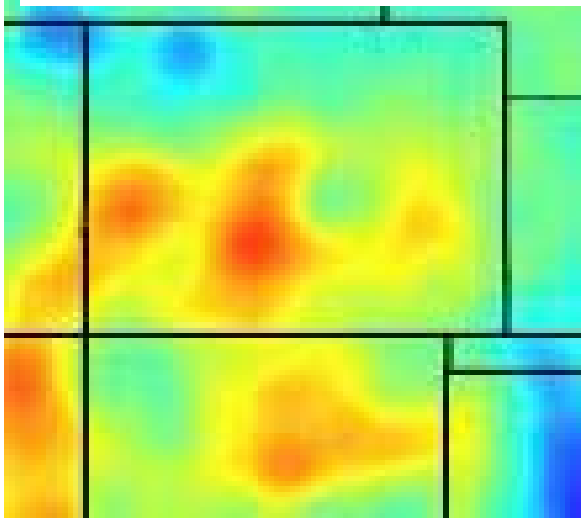
AFT denudation rate >150 m/Ma 5-10 ma



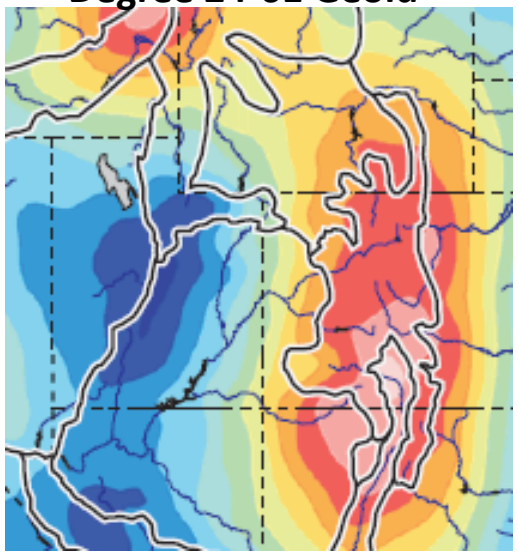
Receiver Function crustal thickness



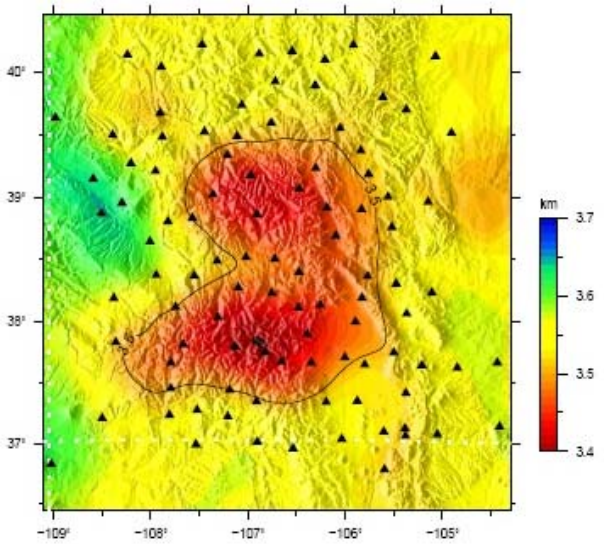
S-wave tomogram 270 km



Degree 24-61 Geoid

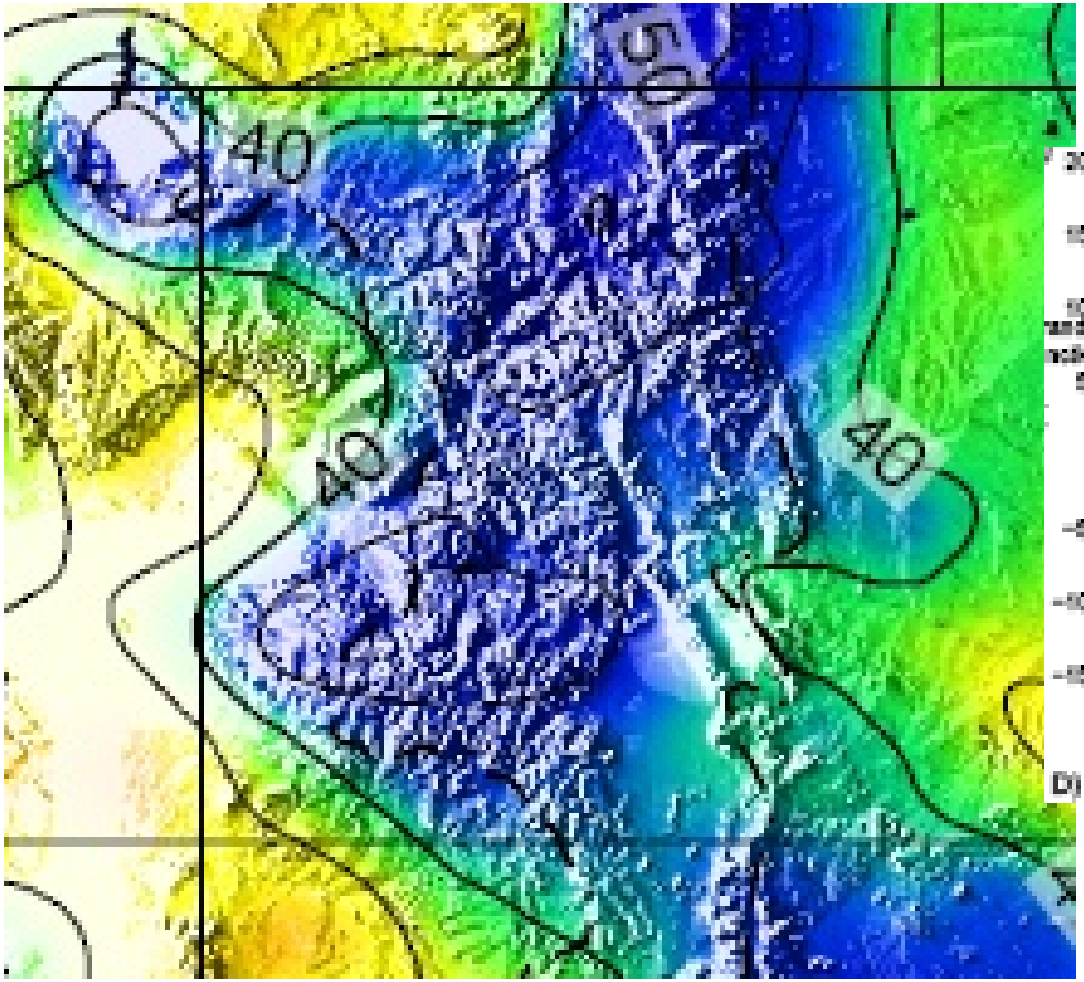


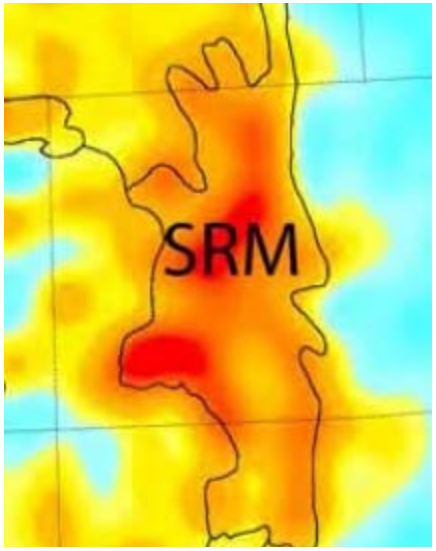
Mean crustal shear wave velocity

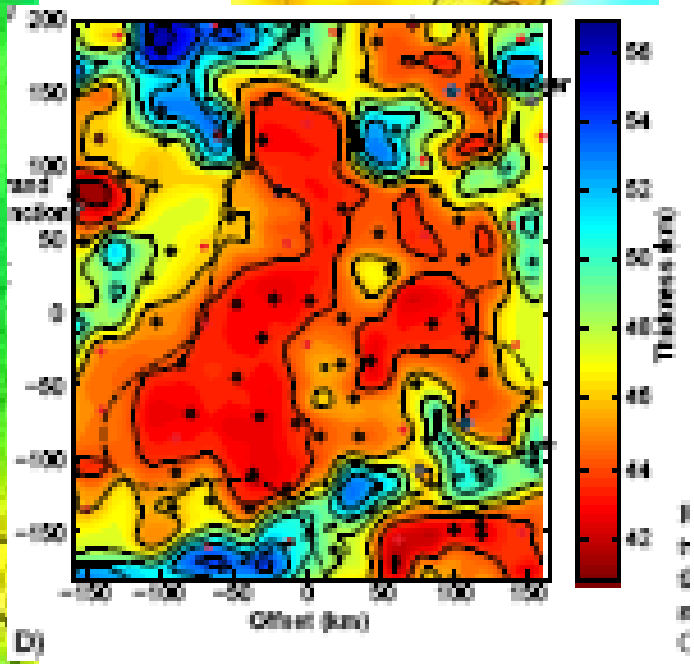


TA-only versus TA+CREST P_ms moho depth comparison

TA data (Gilbert): 40-45 km thick at Colorado dome

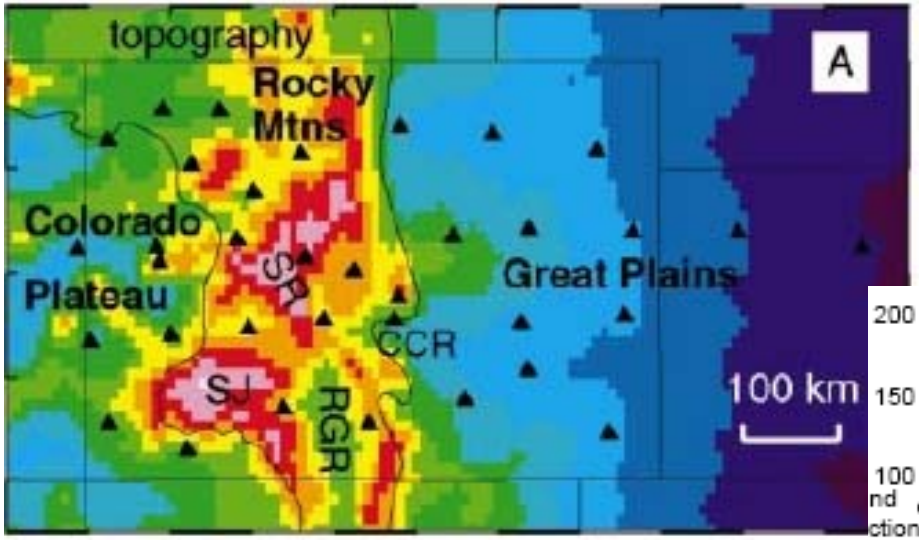


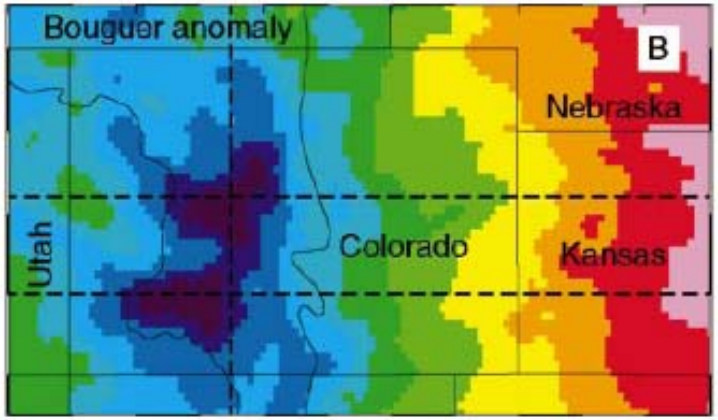


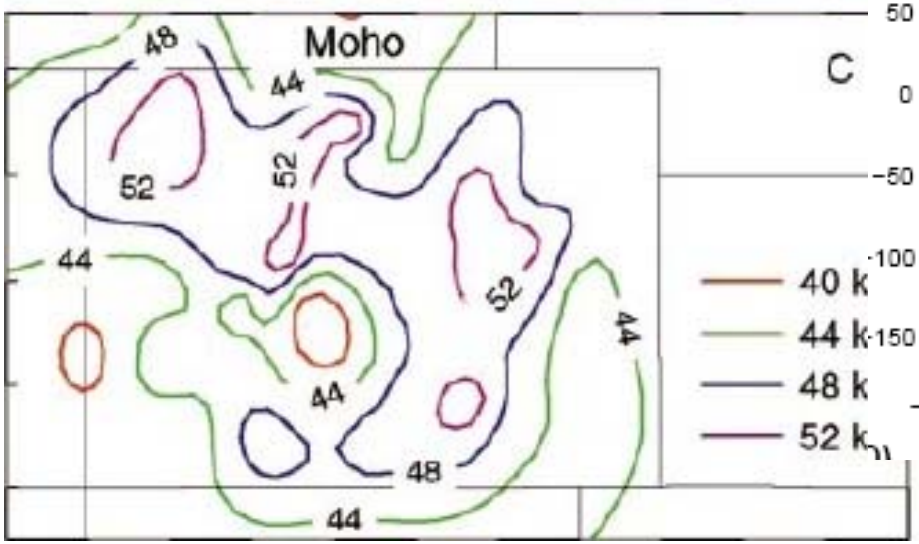


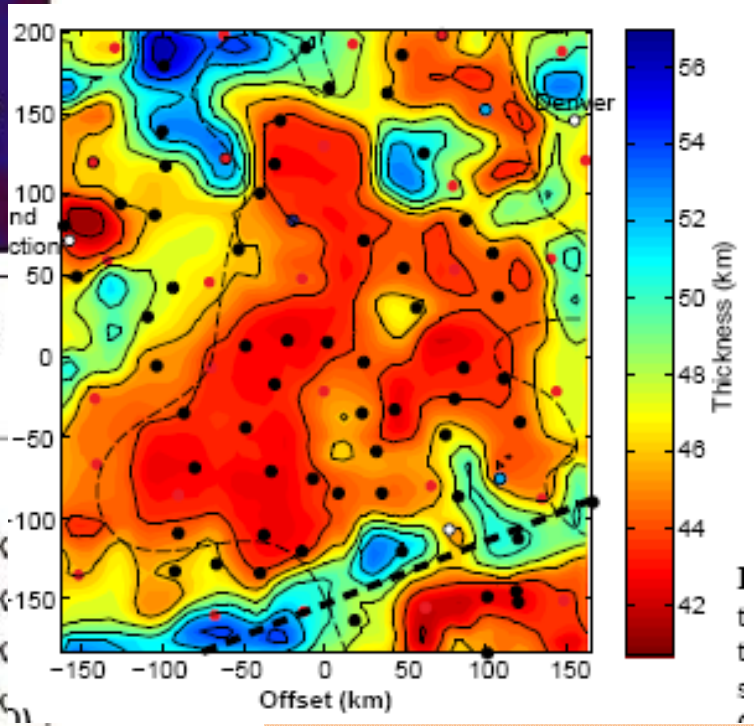
CREST: 44-46 km thick beneath most of Colorado dome

Li et al. versus TA+CREST P_ms moho depth comparison

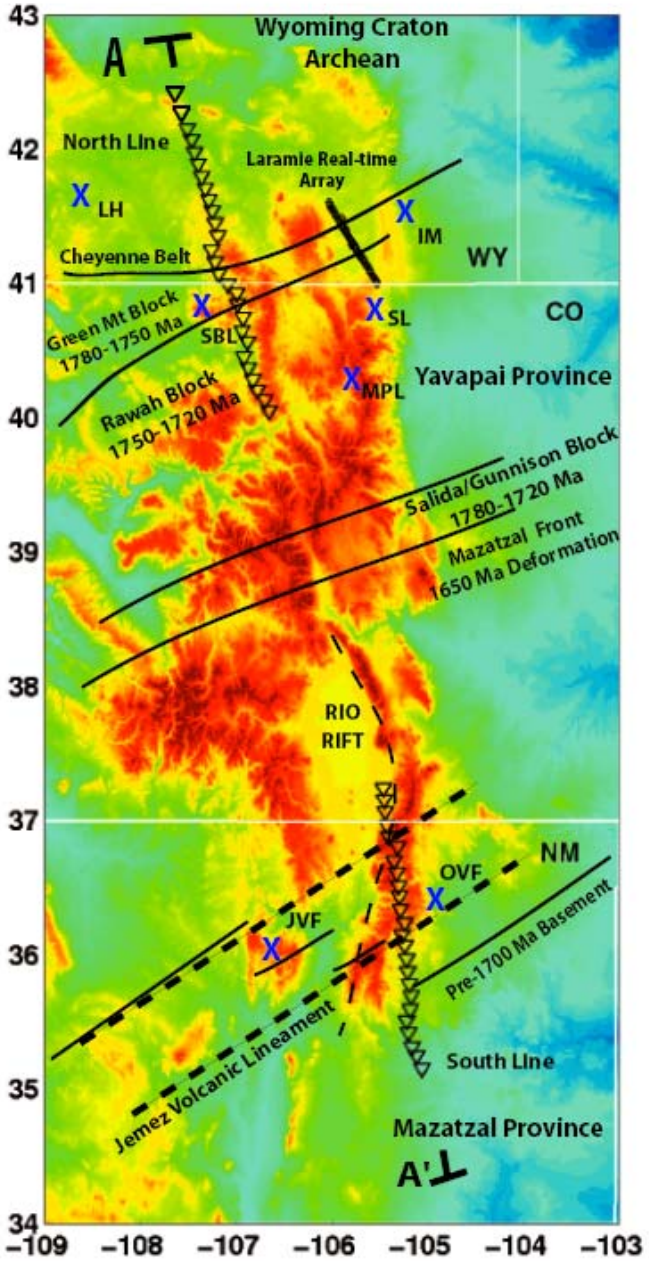


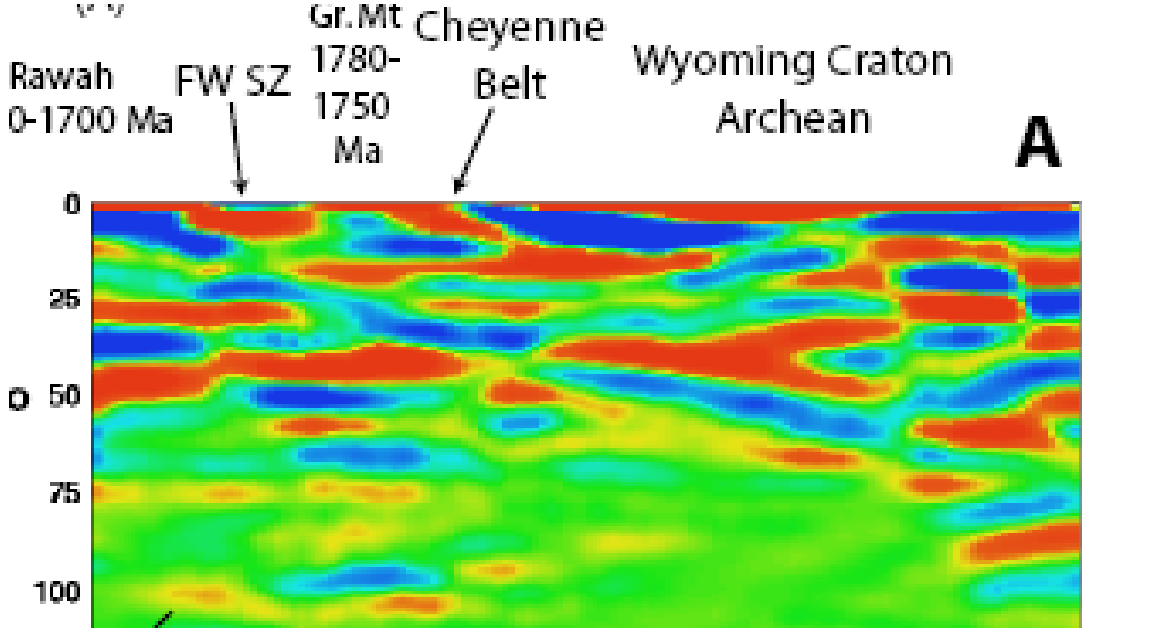


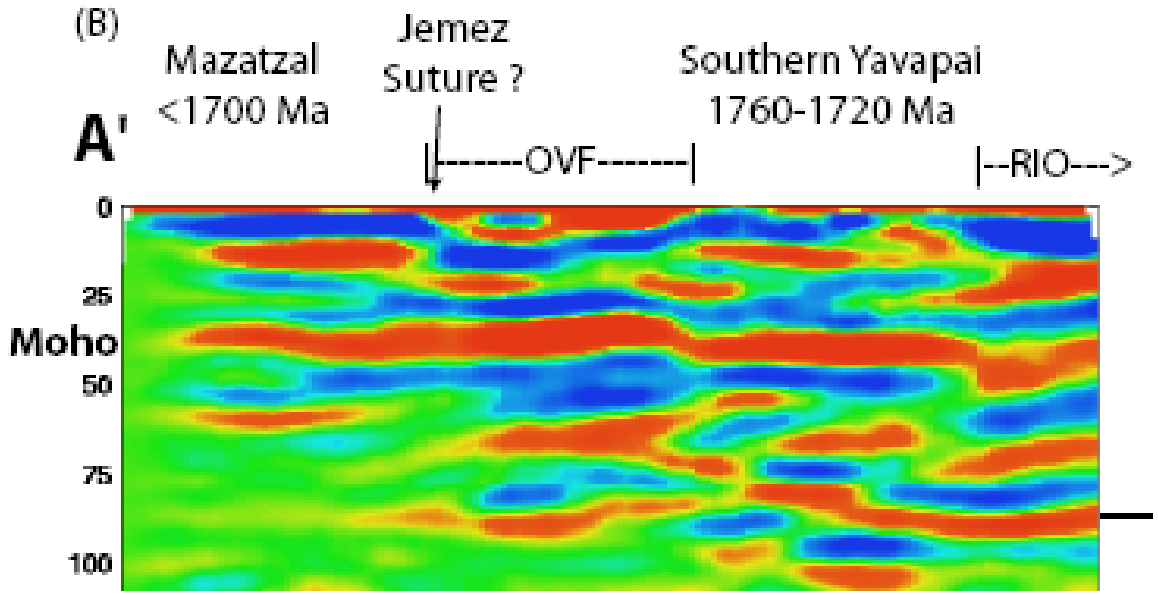




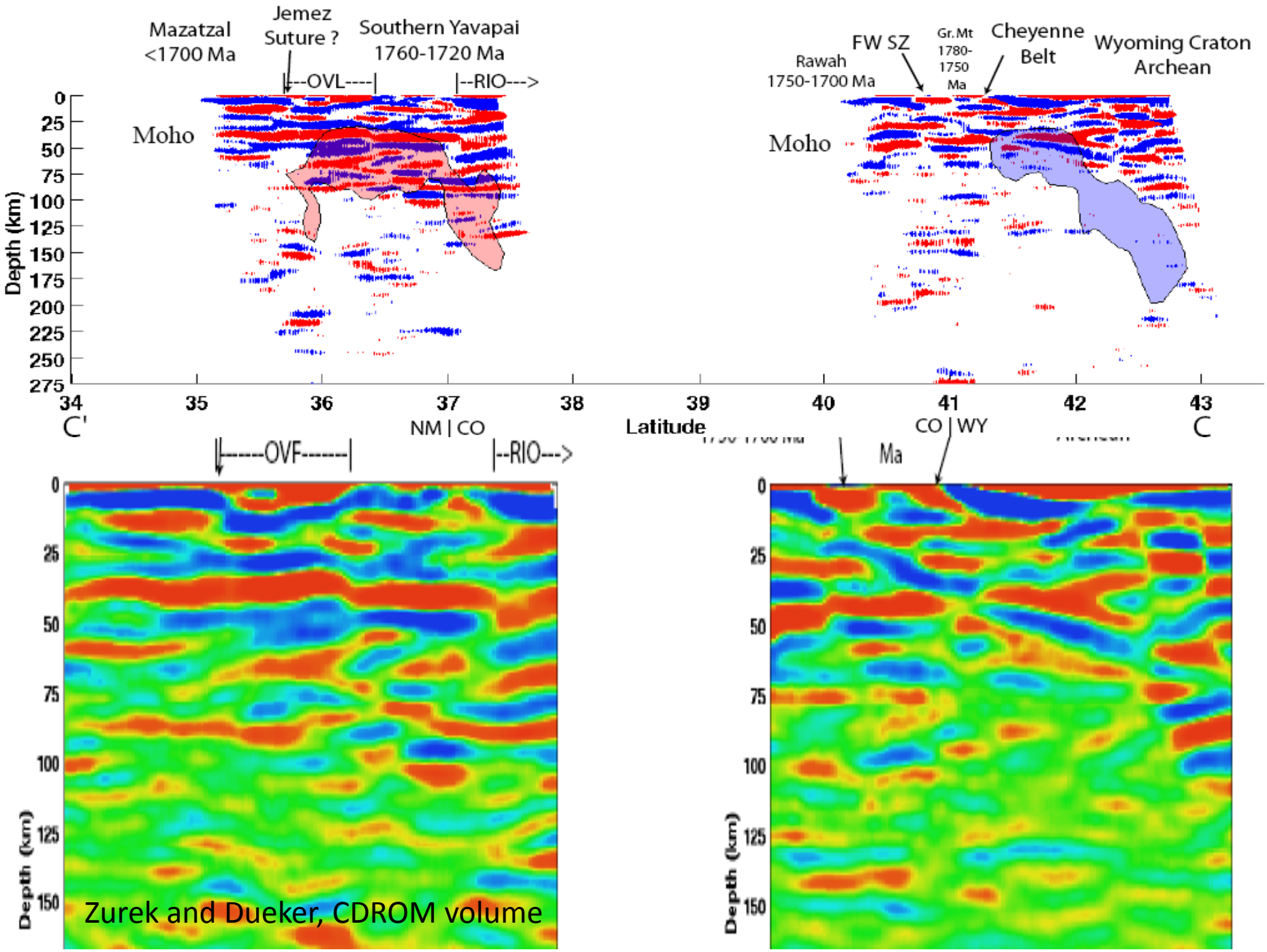
CREST: 44-46 km thick beneath most of Colorado dome



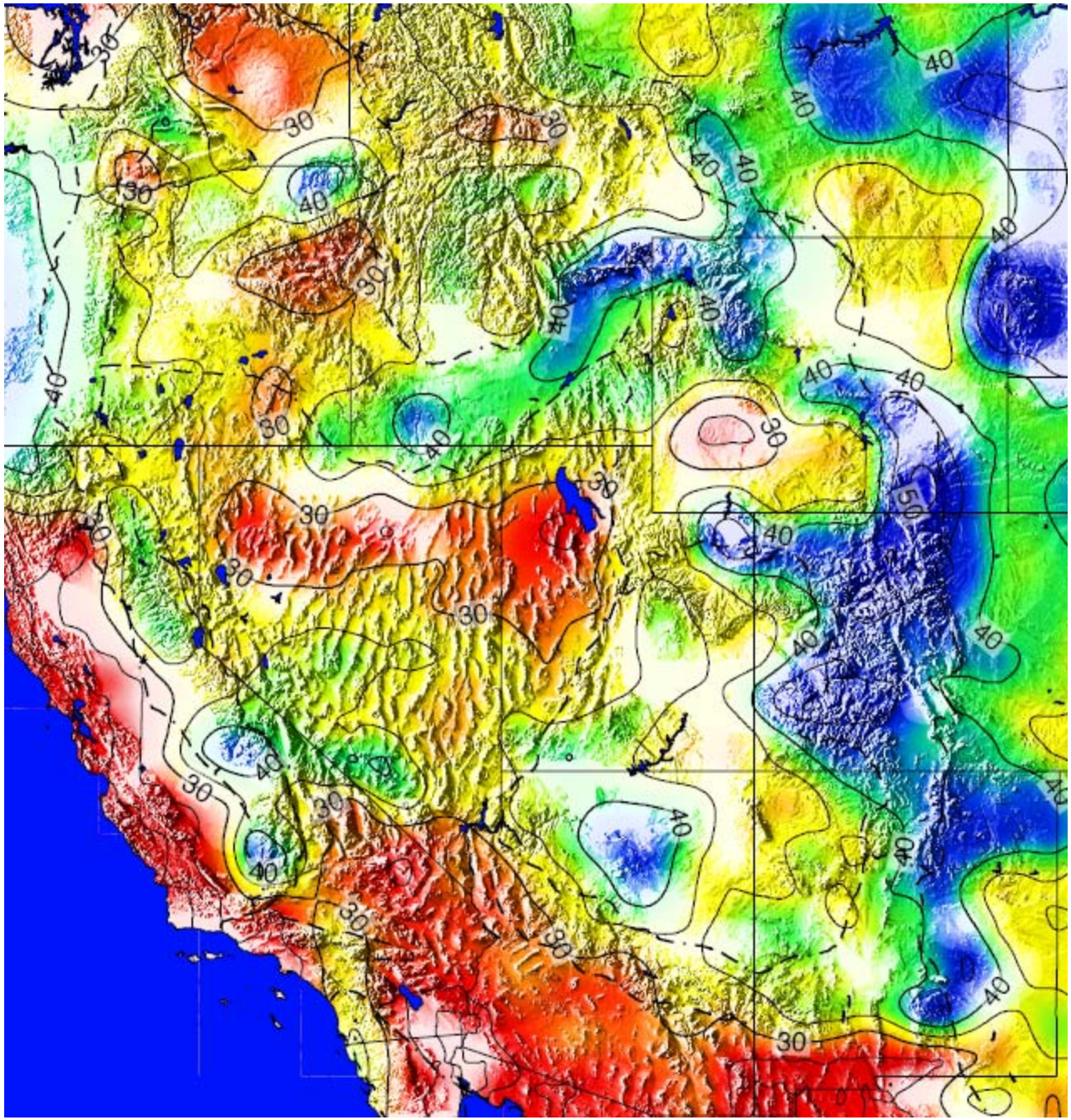




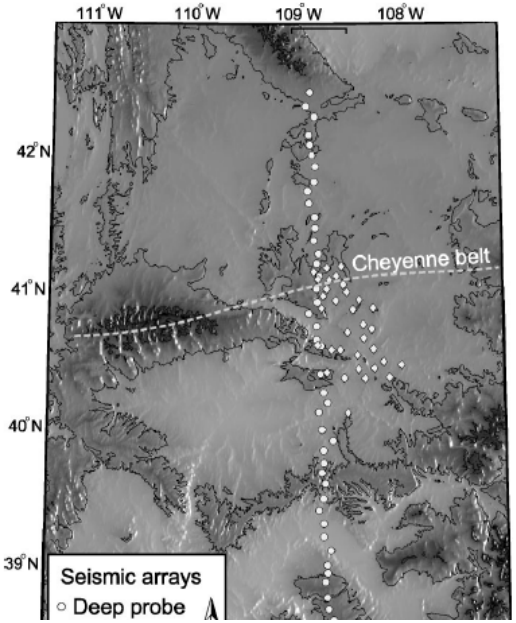
Zurek and Dueker, CDROM volume

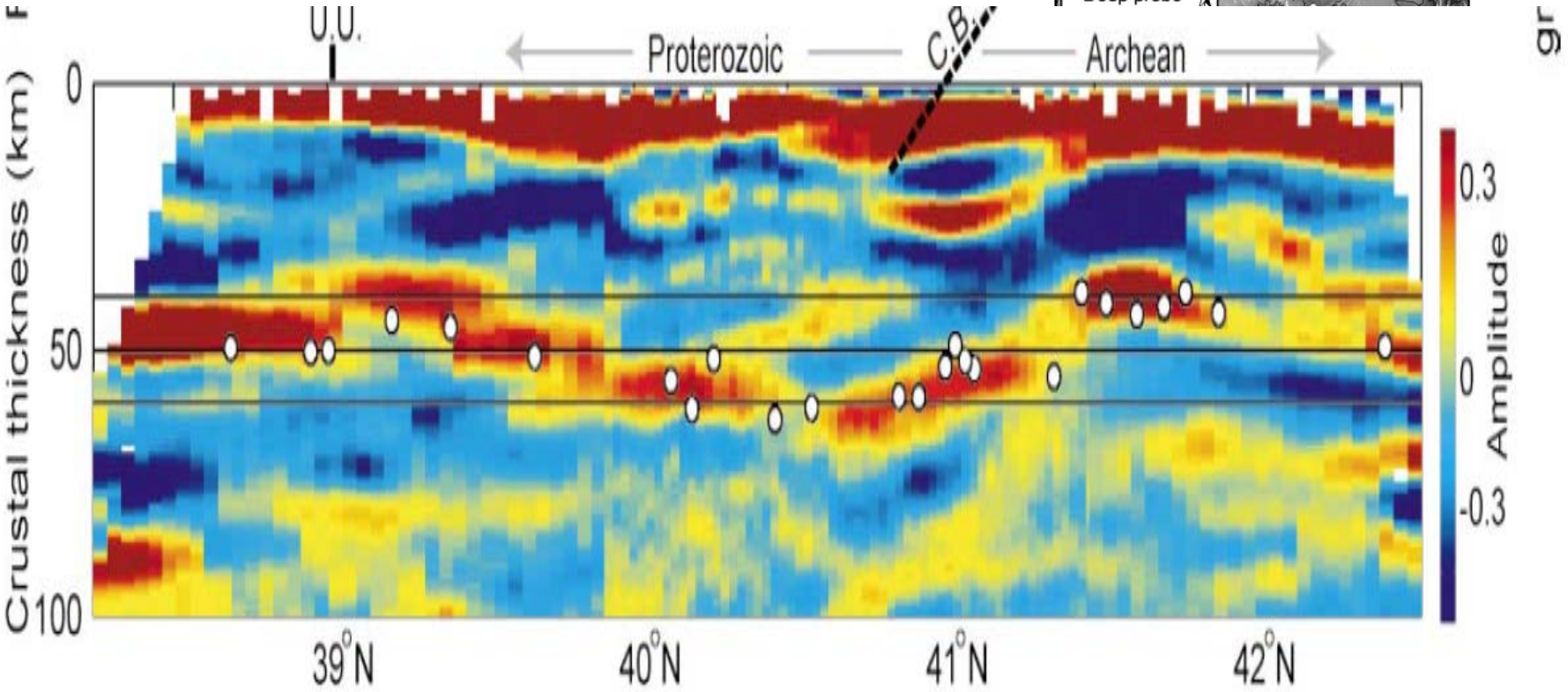

Mazatzal
<1700 Ma
Jemez
Suture ?
Southern Yavapai
1760-1720 Ma
|---OVL----|
|--RIO--->
Moho
Depth (km)
0
25
50
75
100
125
150
175
200
225
250
275
34
35
36
37
38
39
40
41
42
43
C'
NM | CO
Latitude
CO | WY
C
Rawah
1750-1700 Ma
FW SZ
Gr. Mt
1780-
1750
Ma
Cheyenne
Belt
Wyoming Craton
Archean
Moho
|------OVF------|
|--RIO--->
Ma
Depth (km)
0
25
50
75
100
125
150
Zurek and Dueker, CDROM volume

Gilbert
Pms
TA

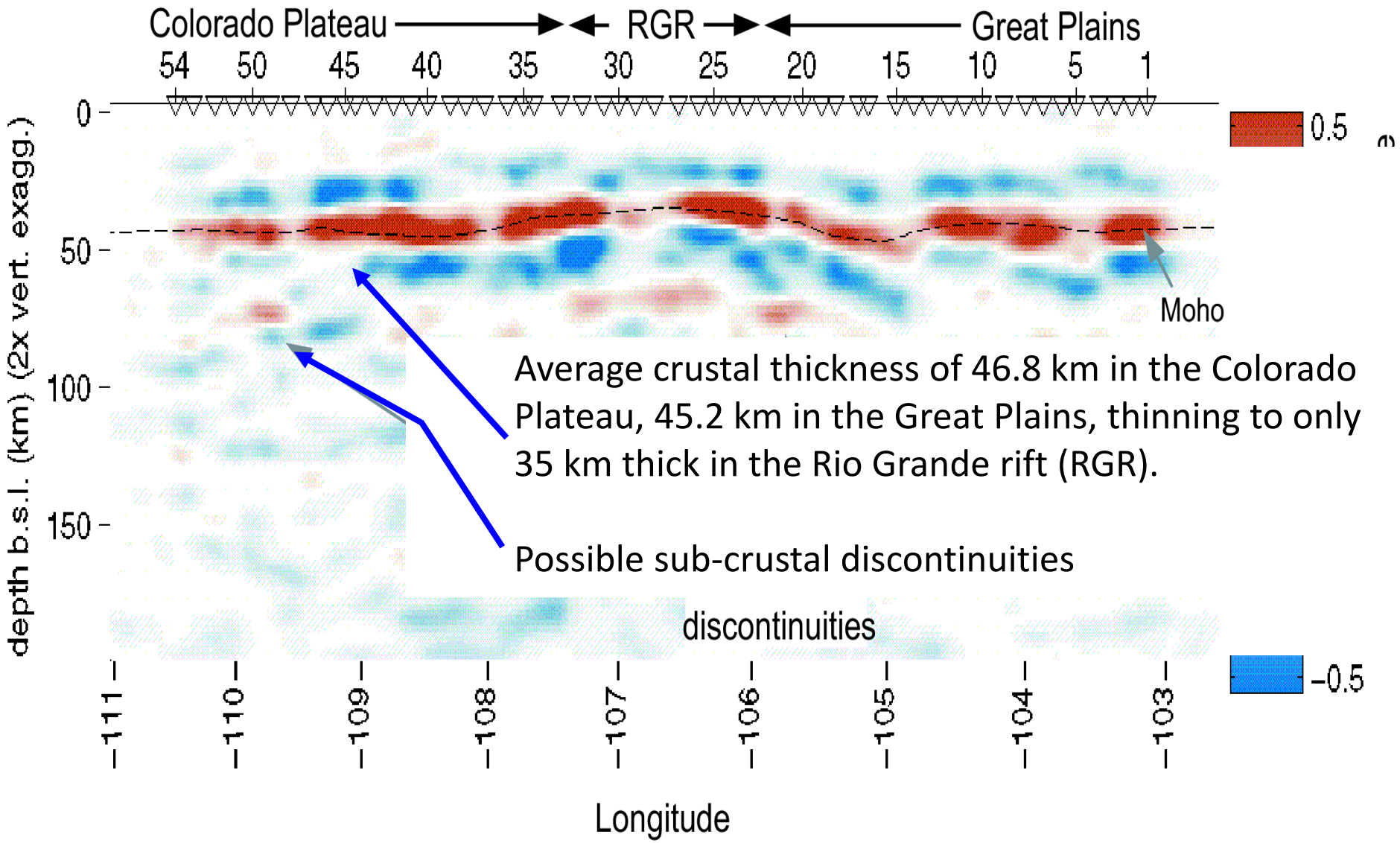


Deep Probe:
Crosswhite and Humphreys



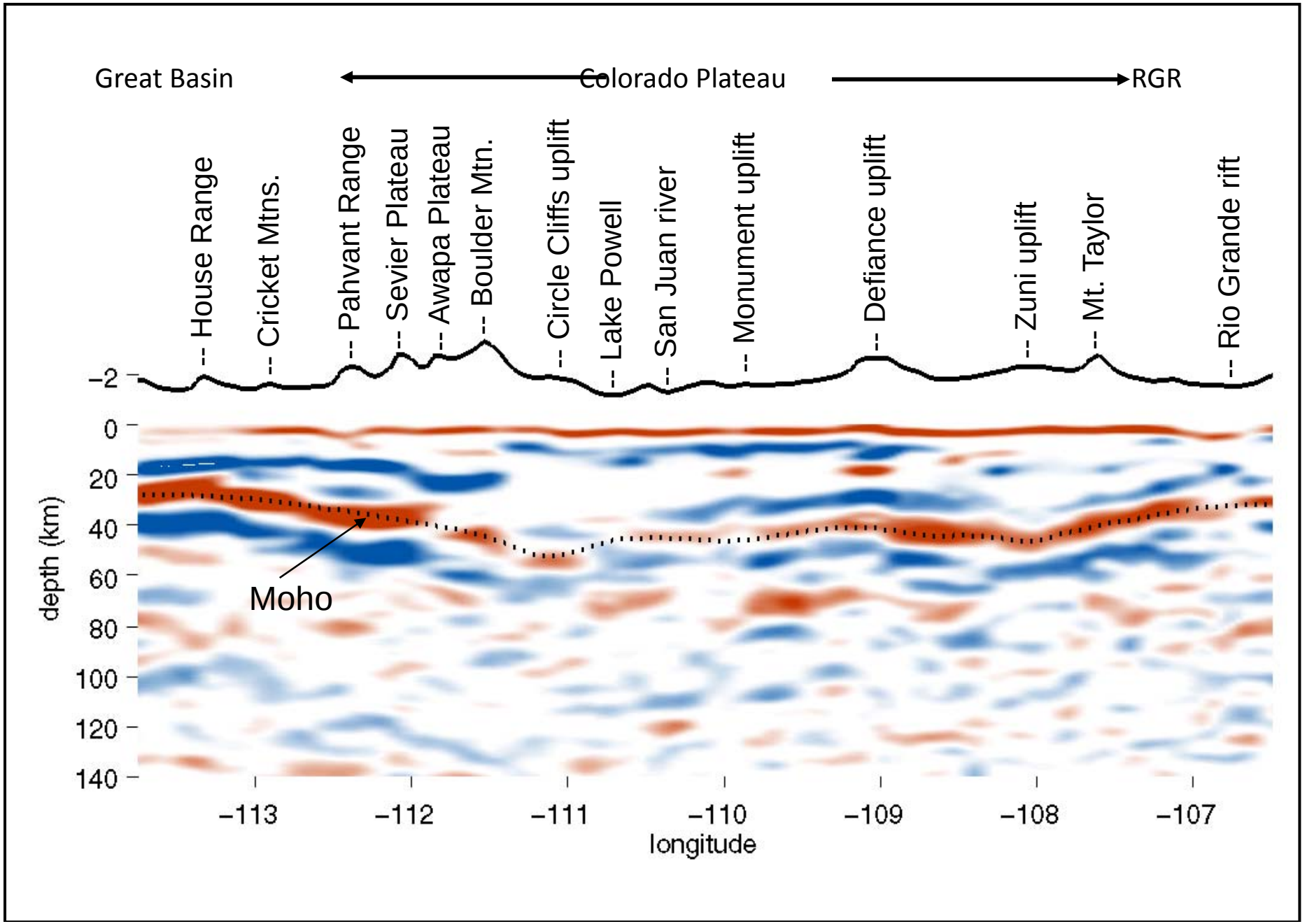


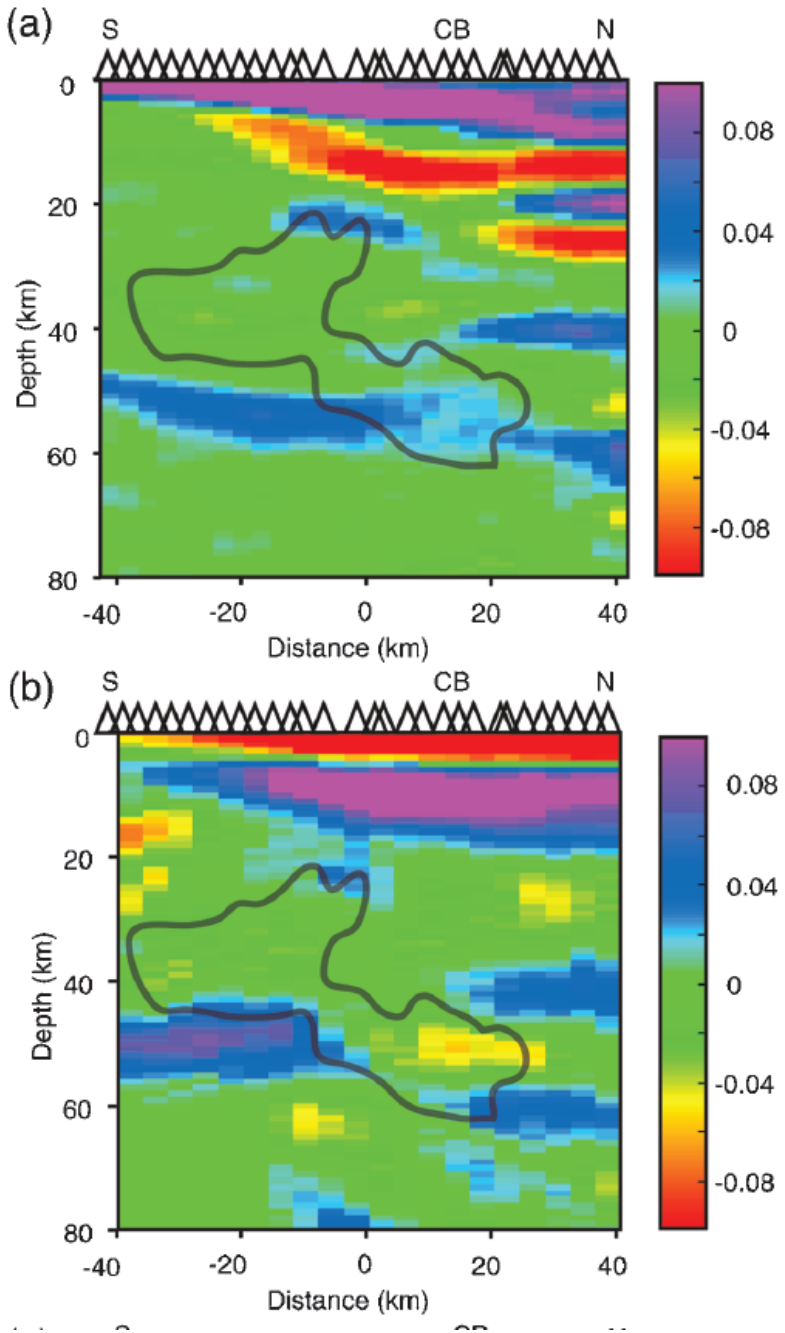
RISTRA 1 receiver function image



Crustal thickness in the Colorado Plateau is not significantly different than the Great Plains, so excess CP elevation is not from thick crust alone.

Colorado Plateau receiver function image





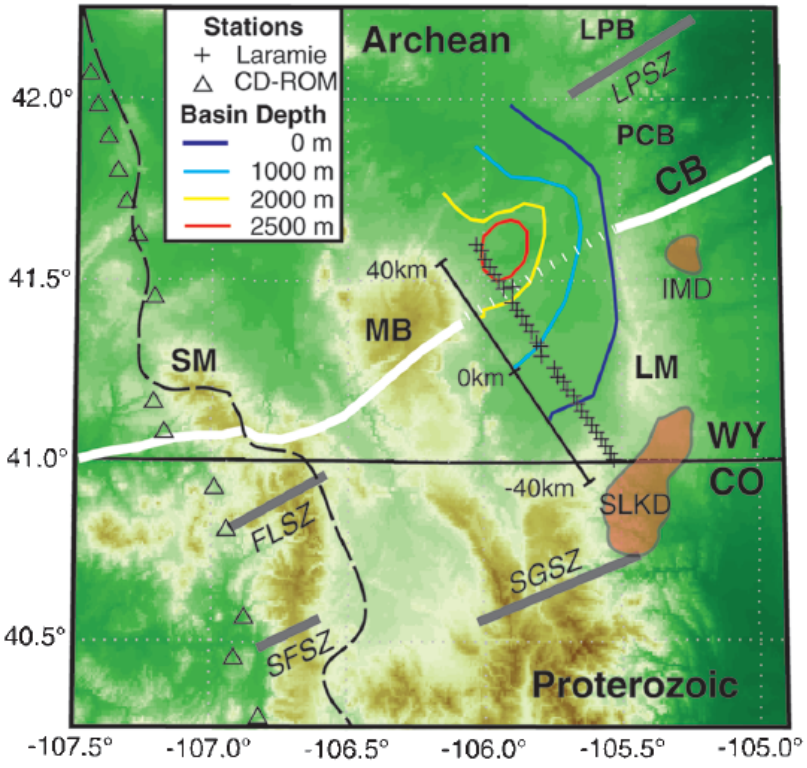
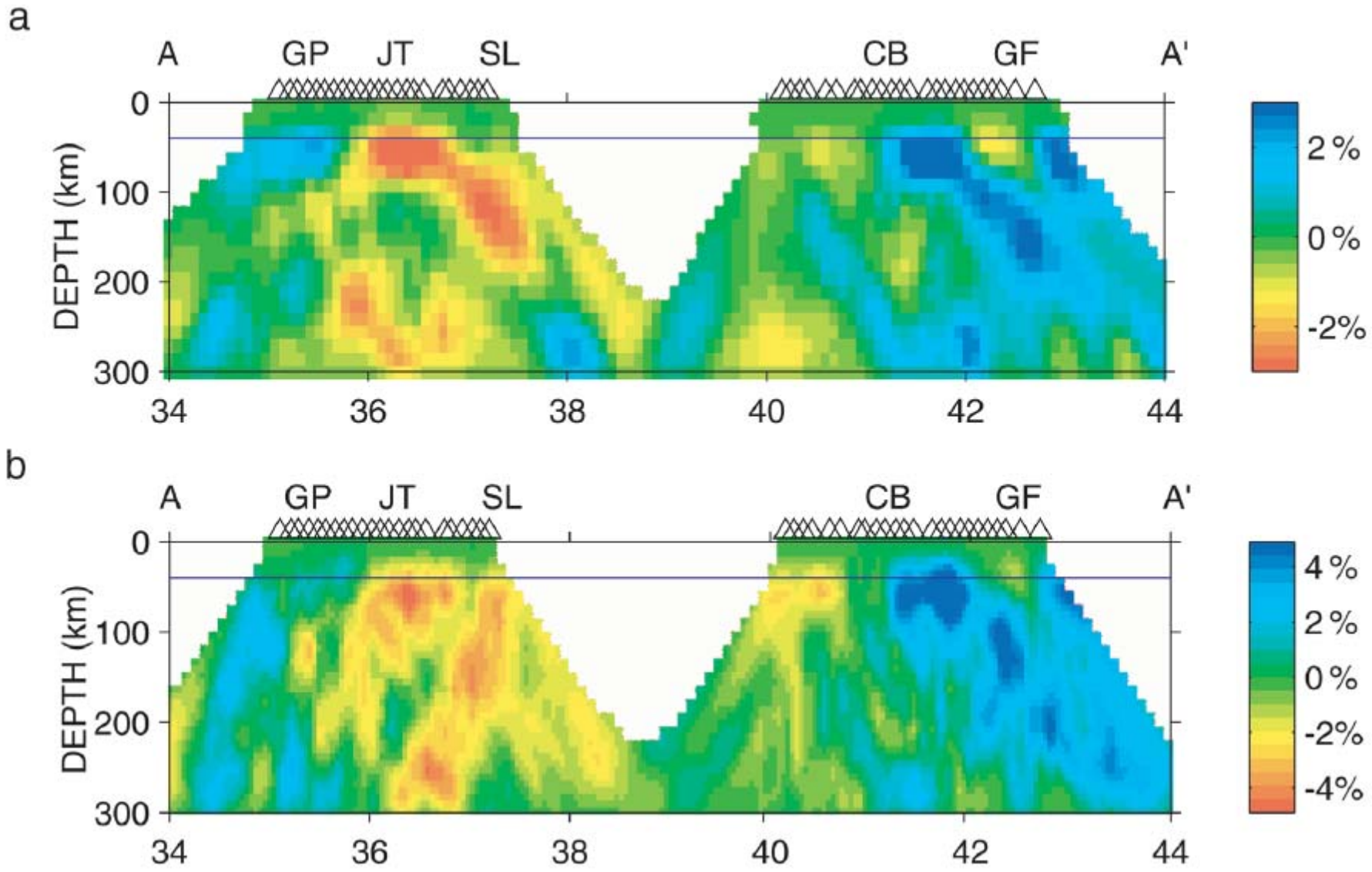
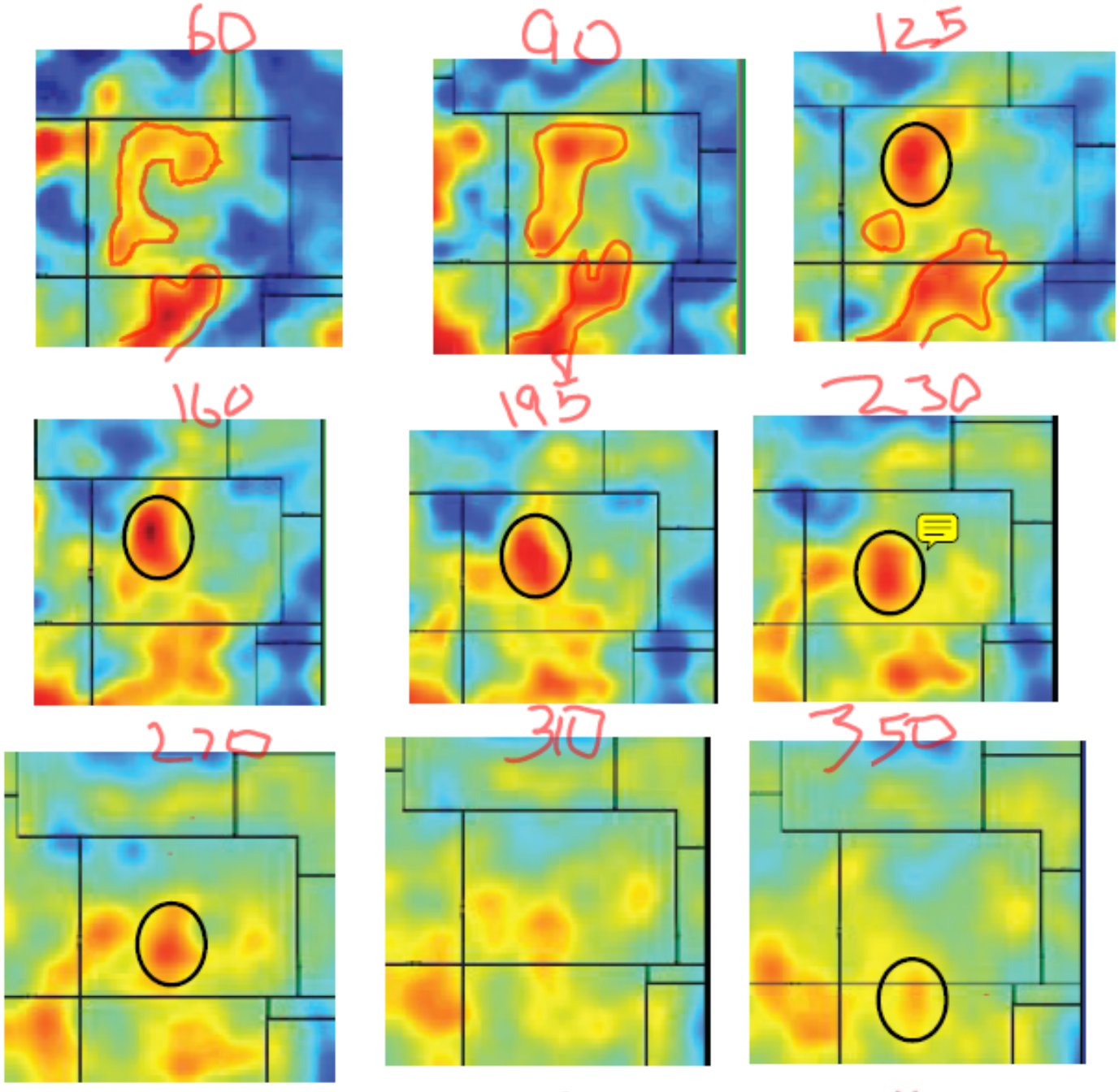


Figure 1. Topography, stations, and crustal shear zones. Geographic features denoted as: Sierra Madres, SM; Medicine Bow Mountains, MB; Laramie Mountains, LM. In the Laramie Mountains, the Palmer Canyon block (PCB) and Laramie Peak block (LPB) are labeled. The black dashed line denotes the CDROM refraction line and the nearby triangles are the broadband seismometers. The Cheyenne belt suture (CB) is the white line, dashed where inferred. Other major shear zones are denoted with gray lines: Laramie Peak shear zone, LPSZ; Farwell Mountain–Lester Mountain suture zone, FLSZ; Soda Creek-Fish Creek shear zone, SFSZ; Skin Gulch shear zone, SGSZ. The location of the Stateline Kimberlite District (SLKD) and Iron Mountain District (IMD) are shaded red.



Yuan and Dueker, CDROM volume

Schmandt and Humphrey



Body wave tomogram comparison

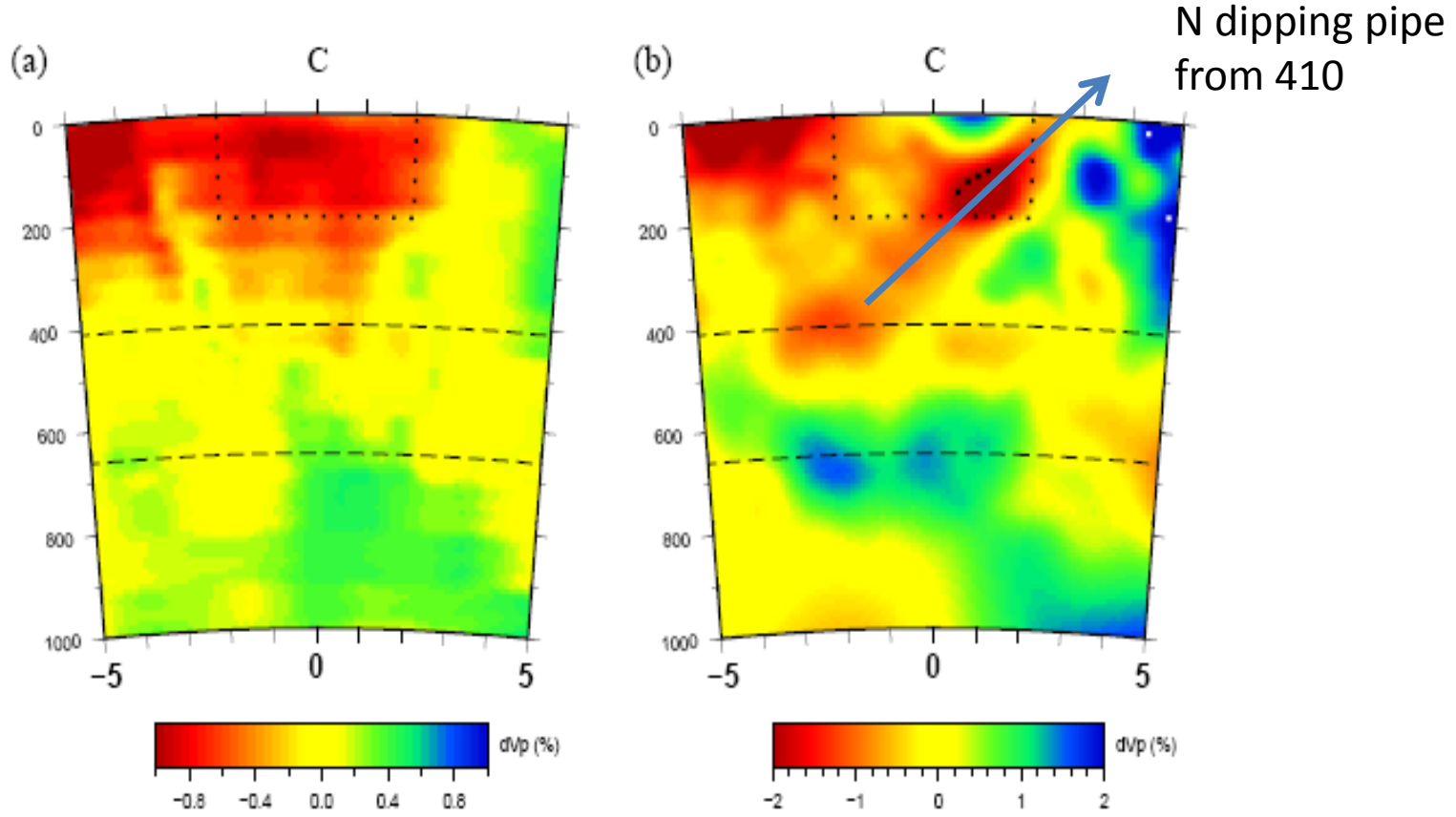
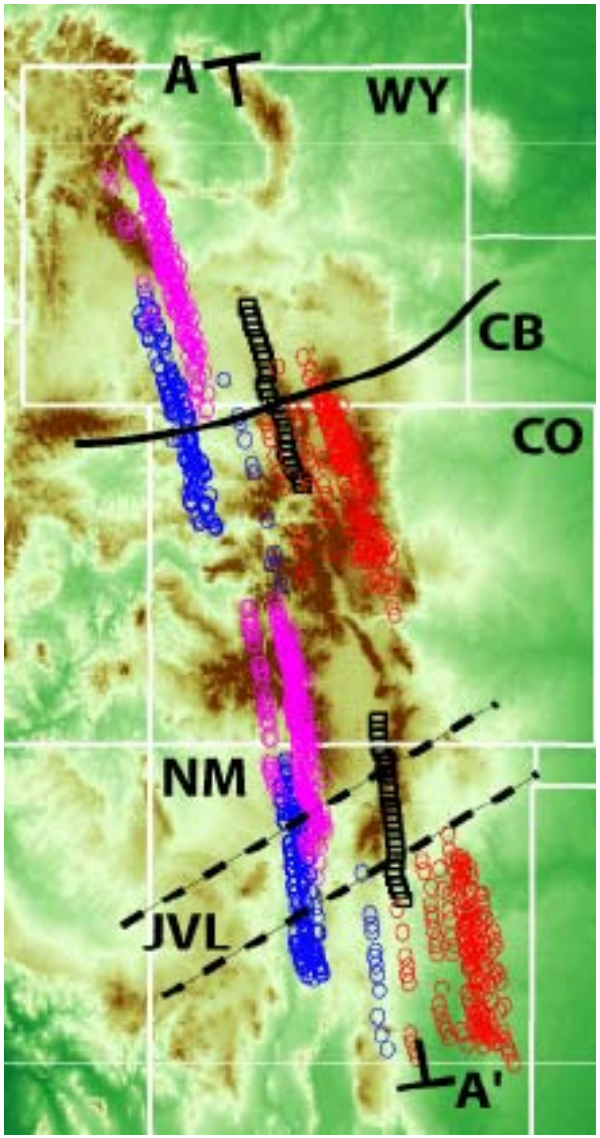
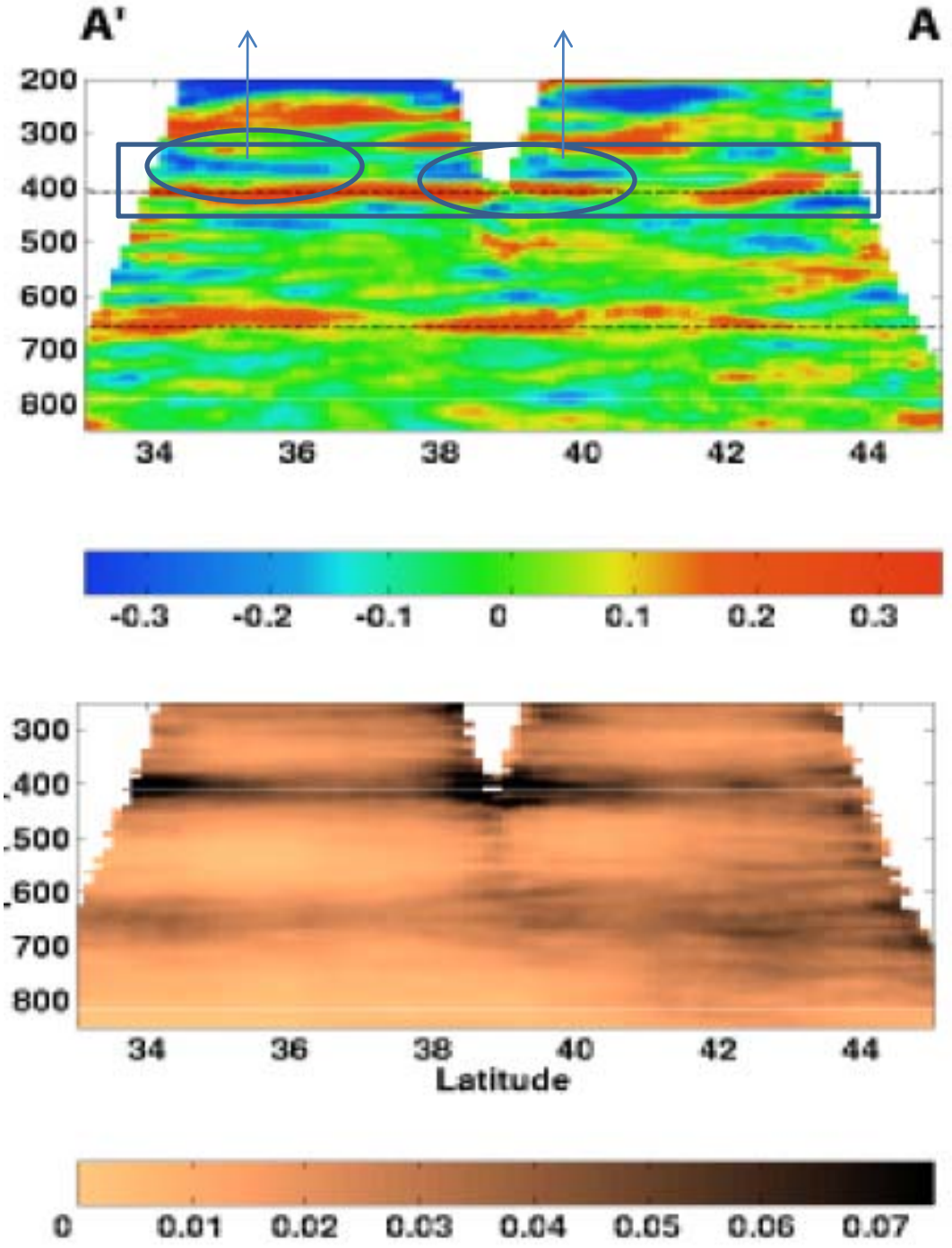


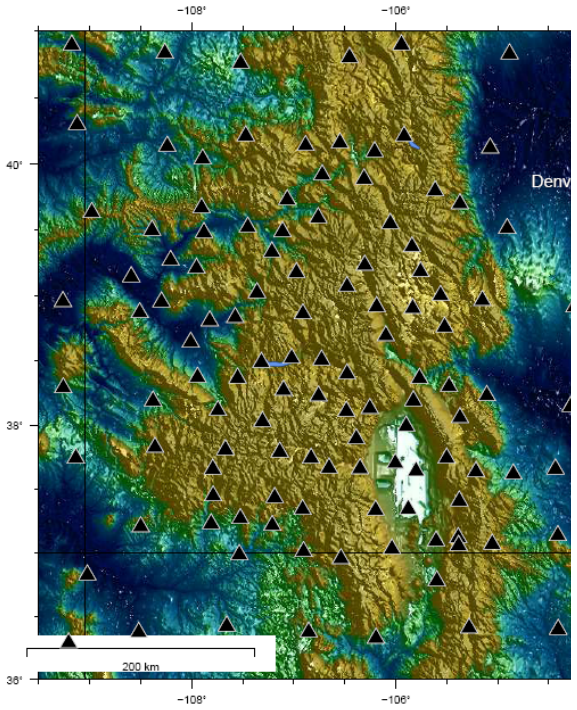
Figure 5.12: Comparison of regional P-wave tomograms along cross section C. (a) Burdick et al. (2010) (b) Schmandt et al. (2010).

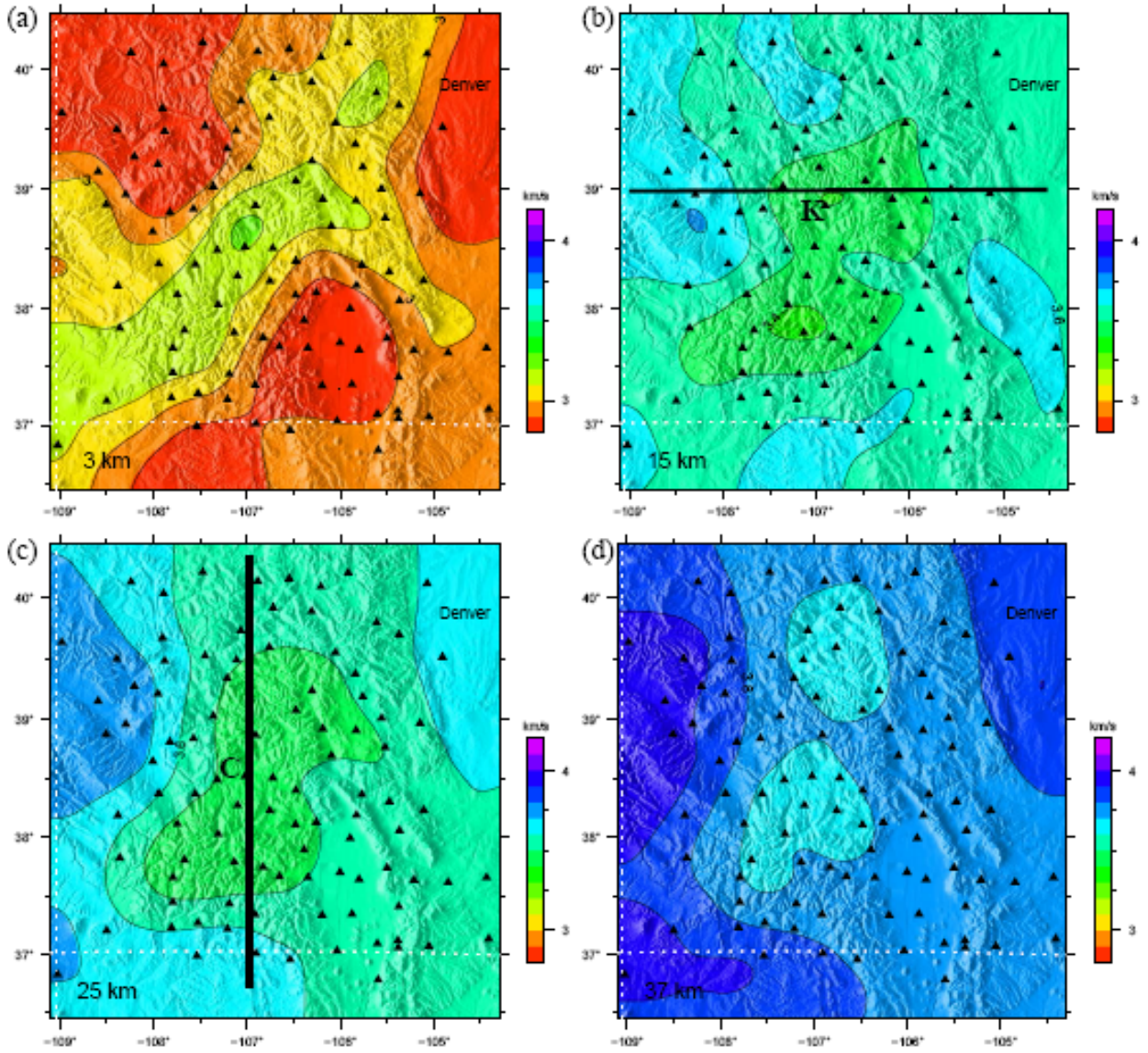
CDROM 410-LVL
410 diapirs?





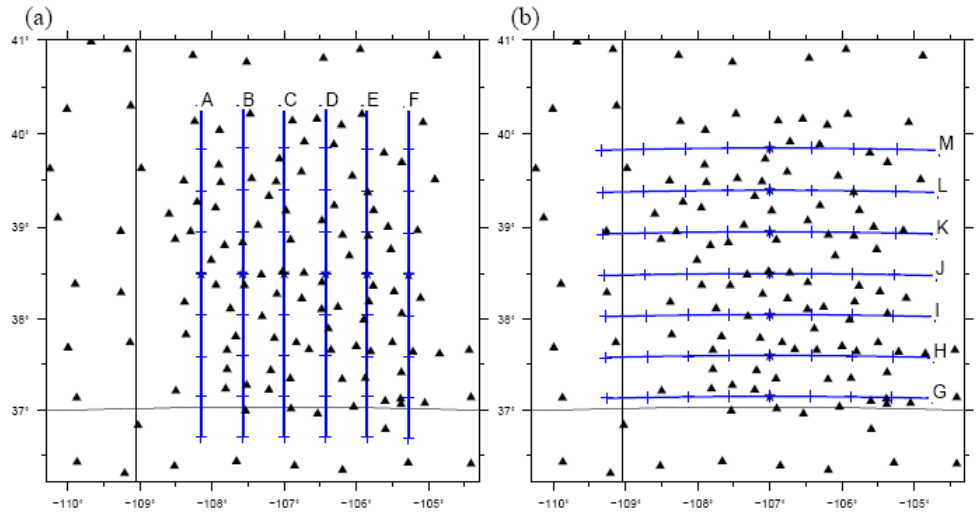
Ambient noise images: Stachnik

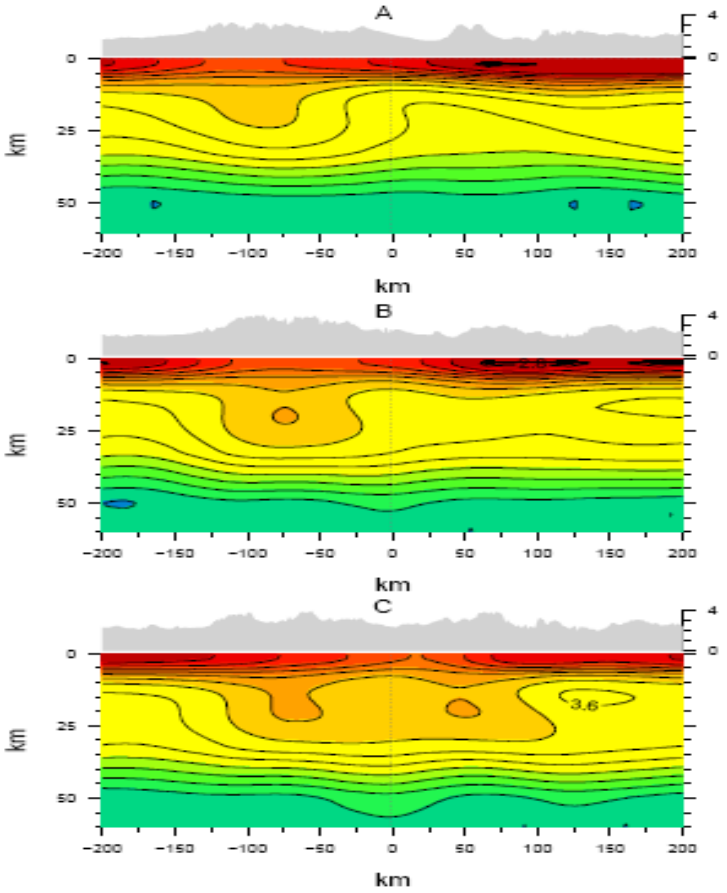


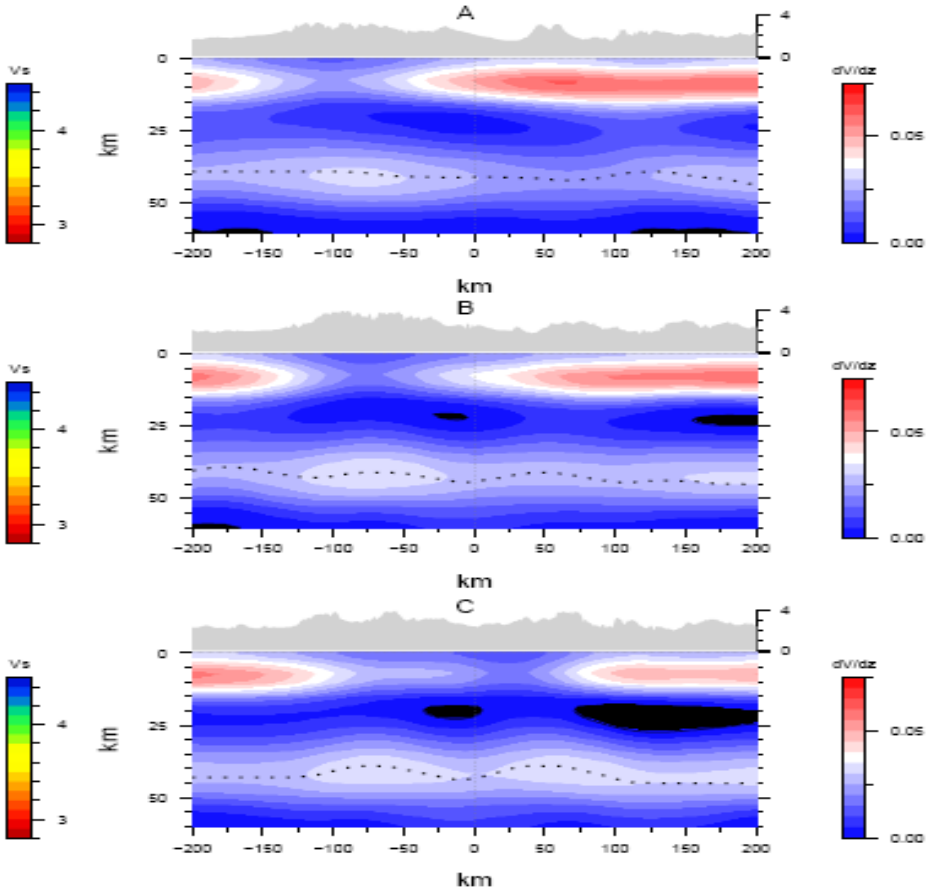


(left) Ambient noise x-sections

(right) vertical velocity gradient

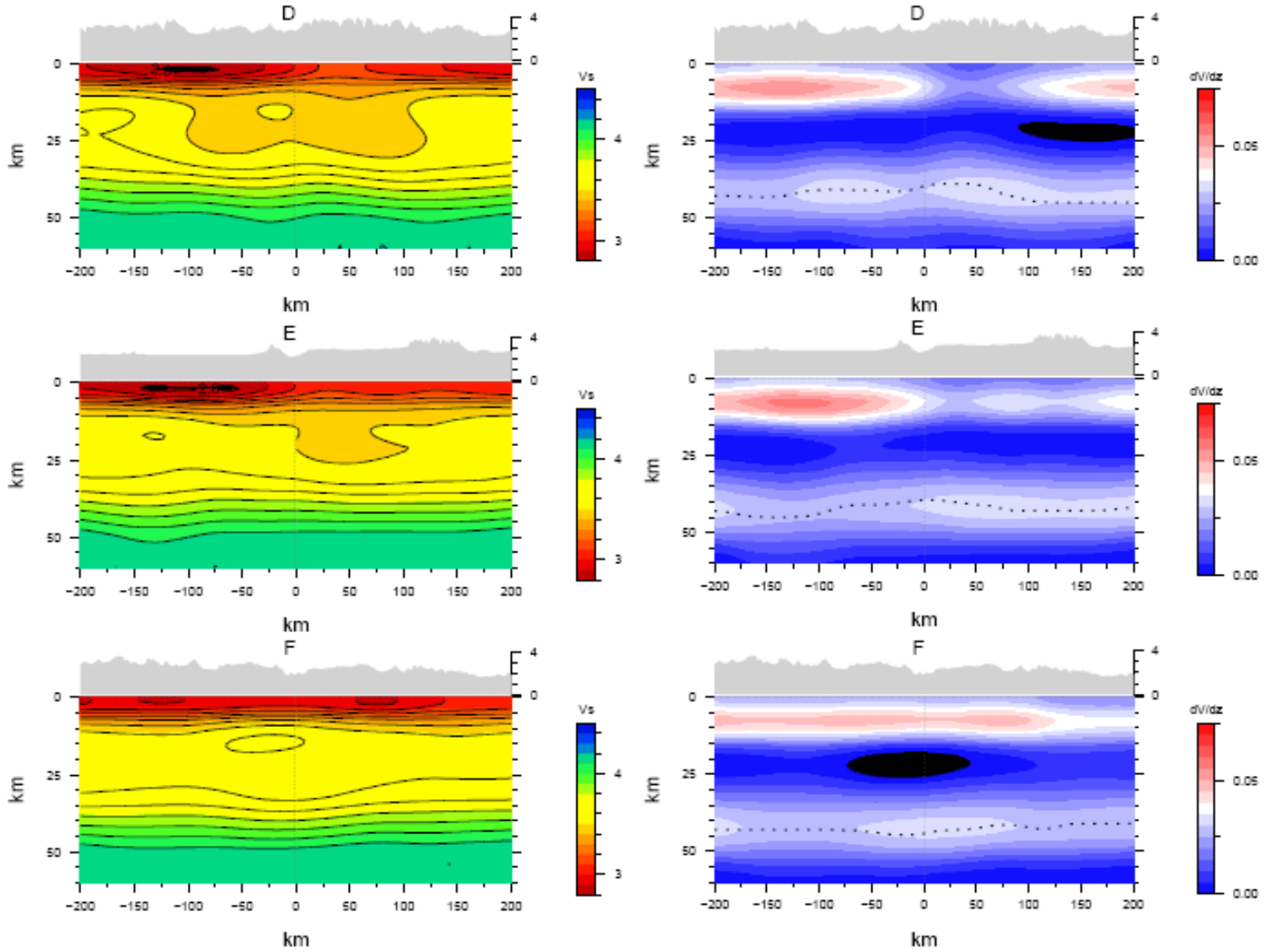


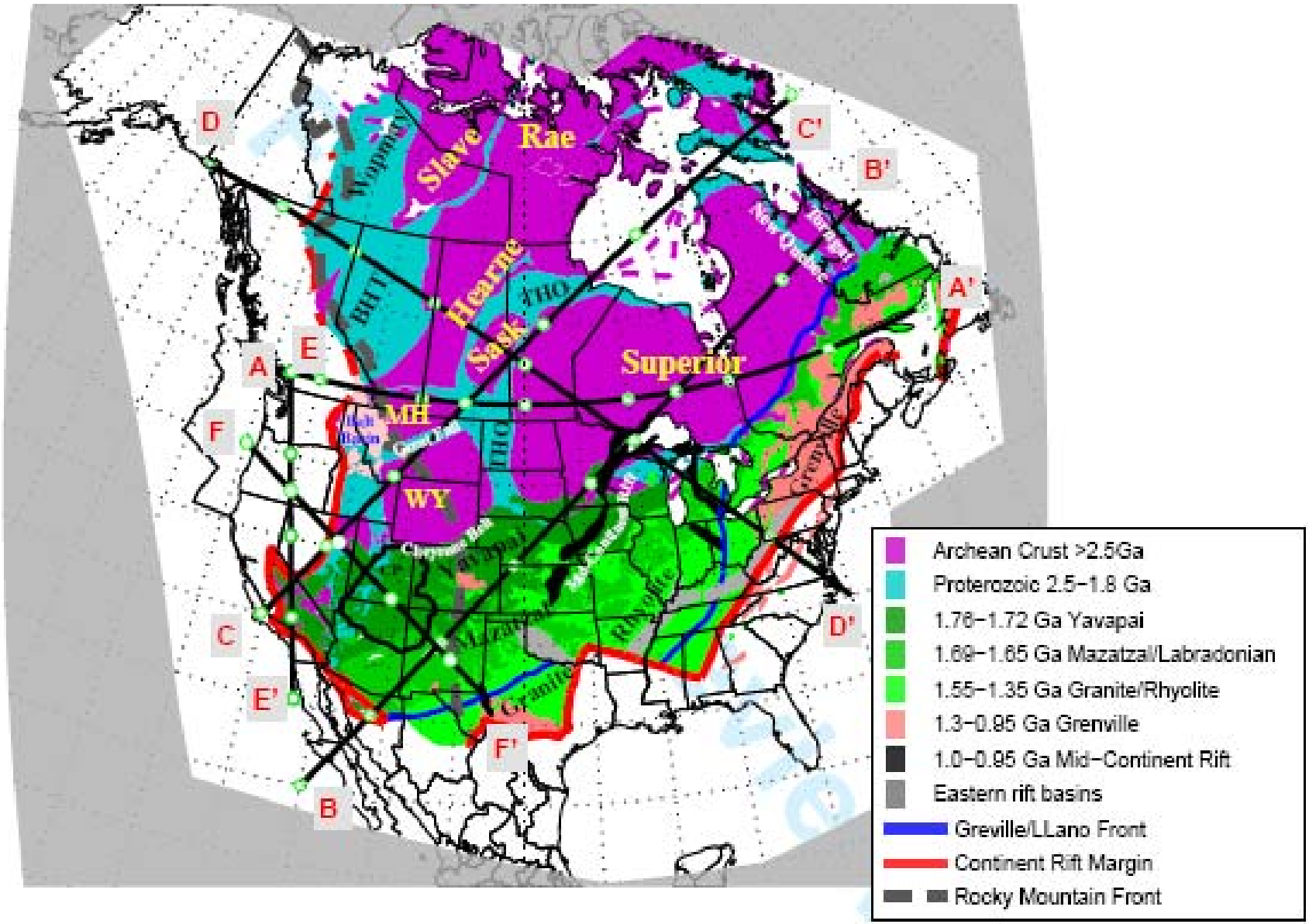




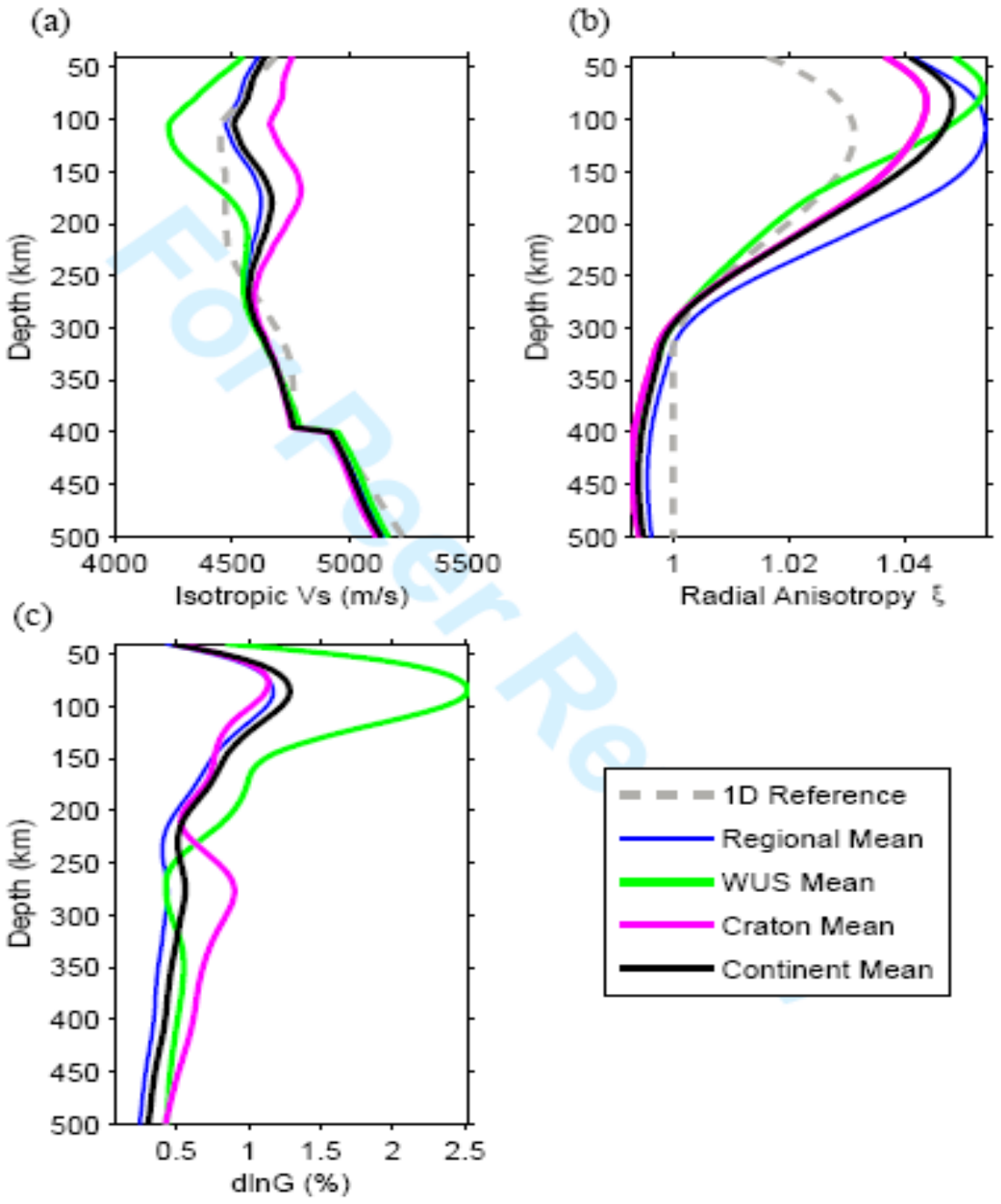
(left) Ambient noise x-sections

(right) vertical velocity gradient



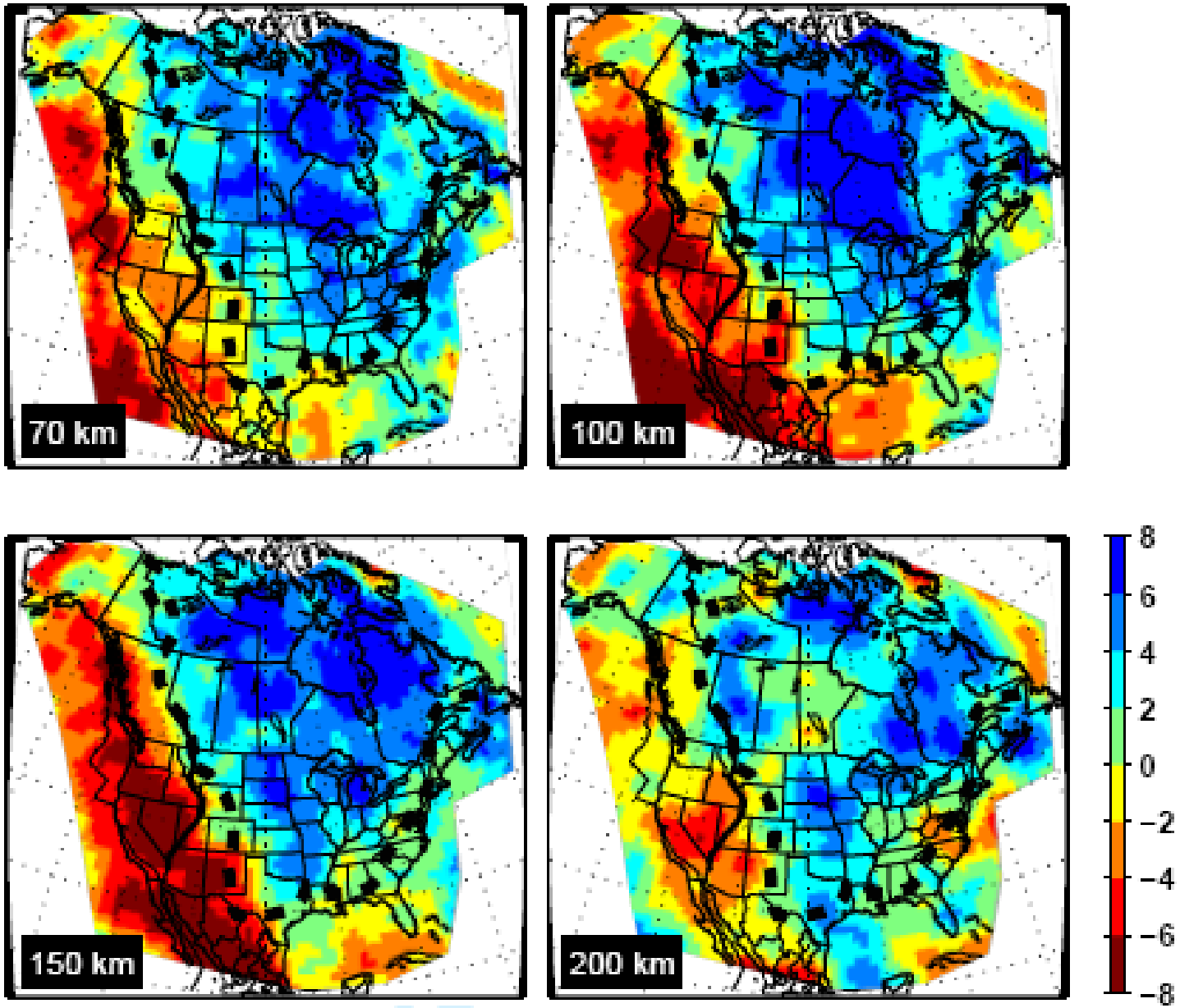


Yuan et al, in review: case for a 150 km thick lid beneath Colorado

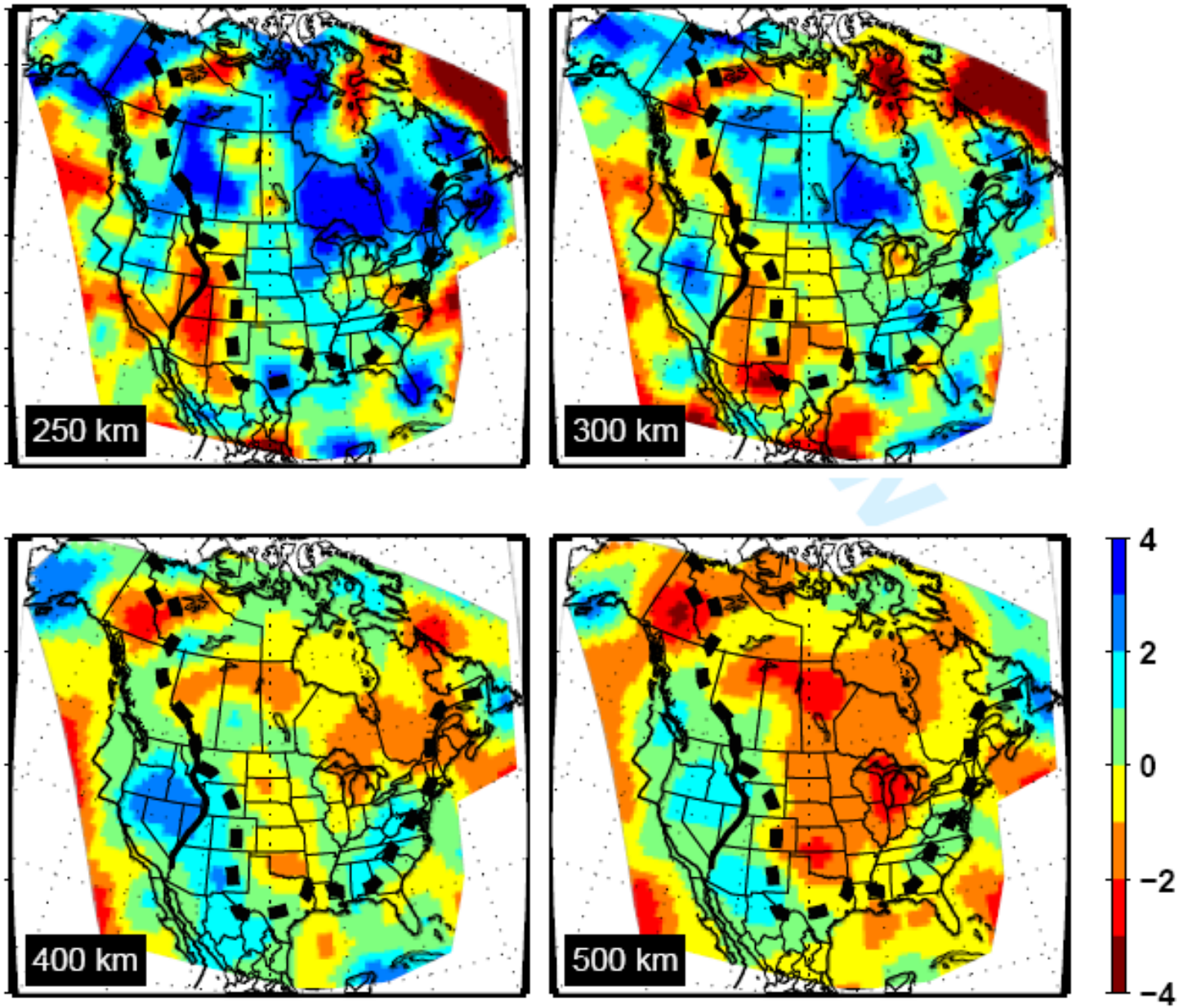


Yuan et al, in review;

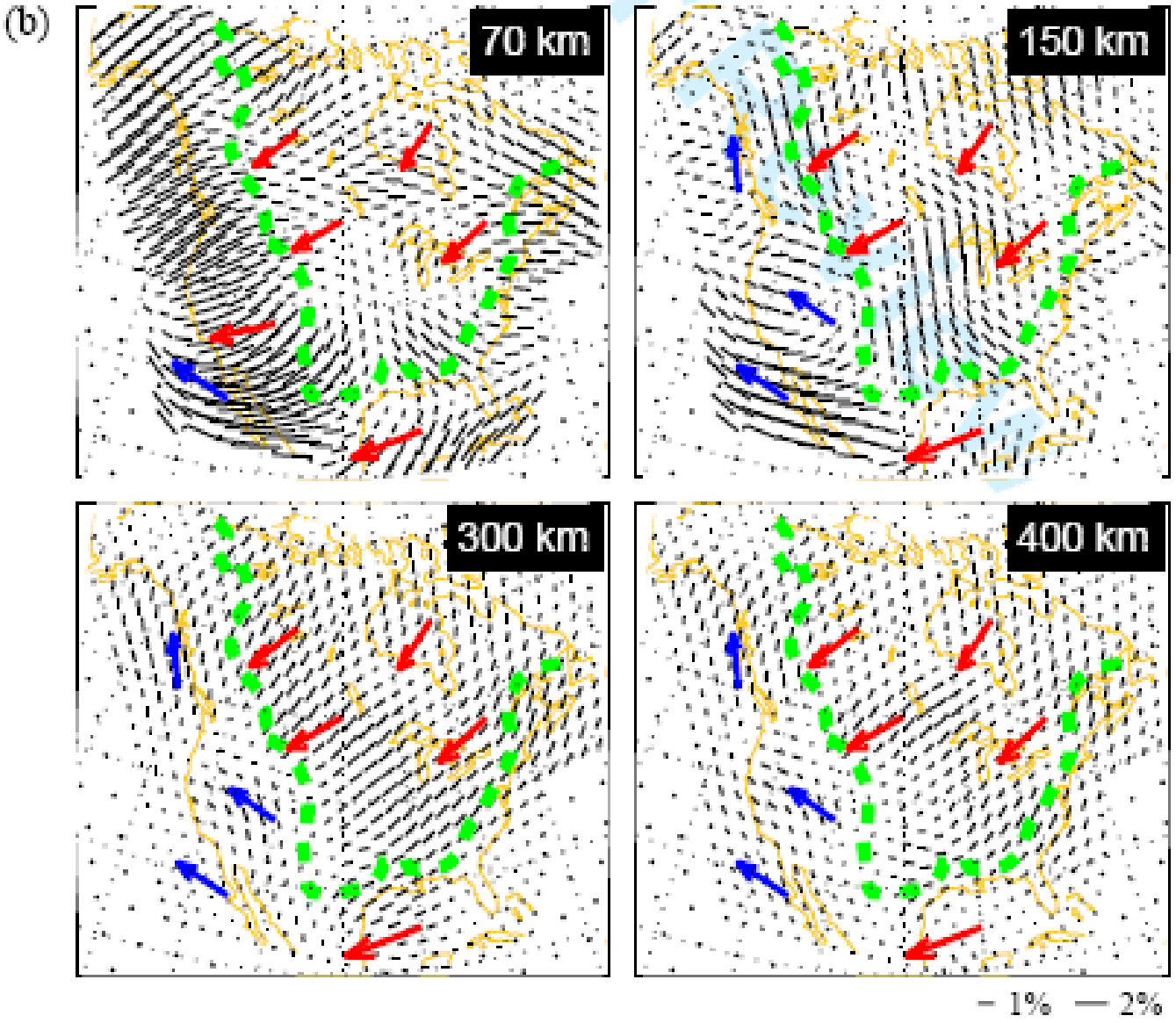
Mean SV, Xi, G parameters



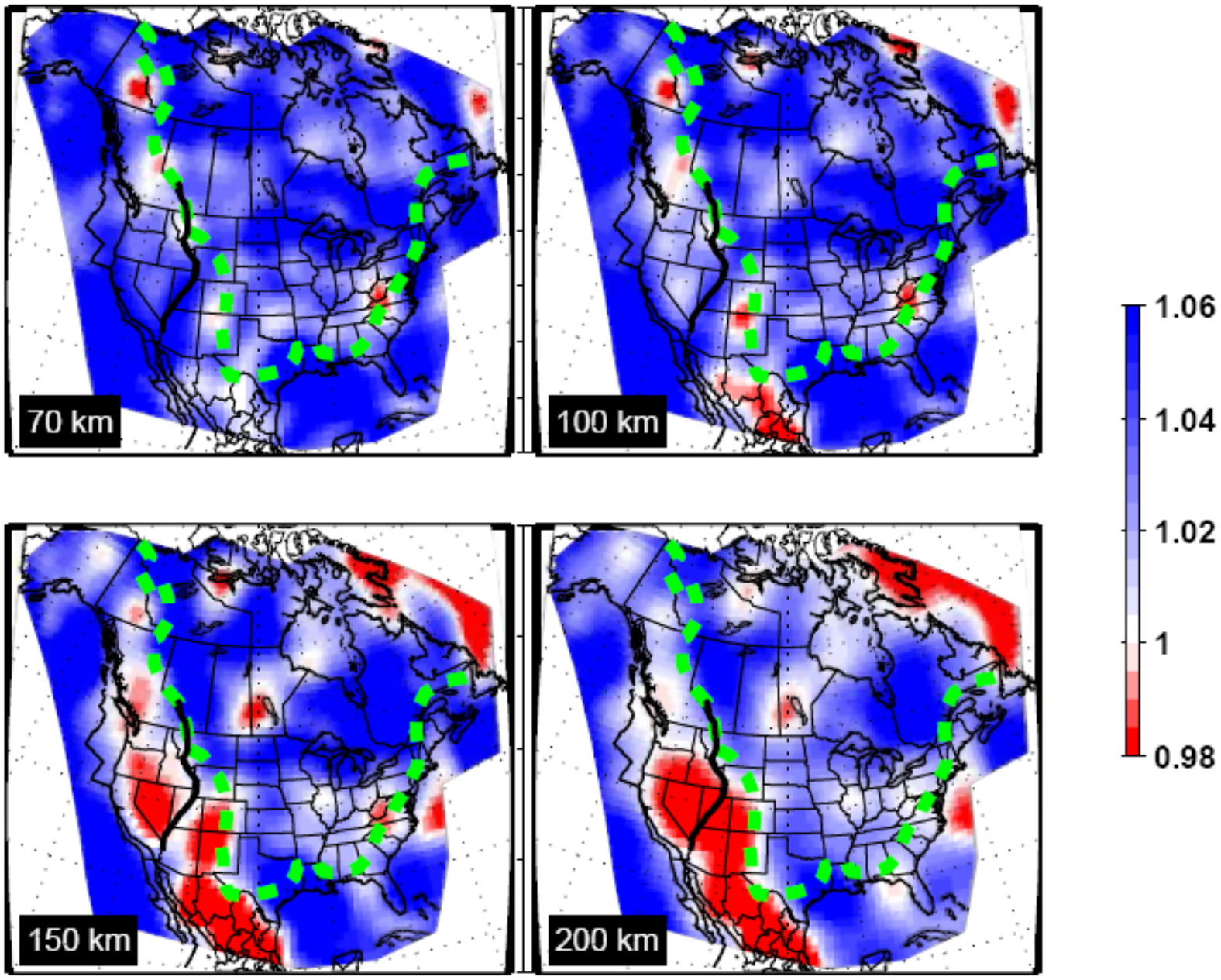
Yuan et al, in review: Isotropic SV velocity



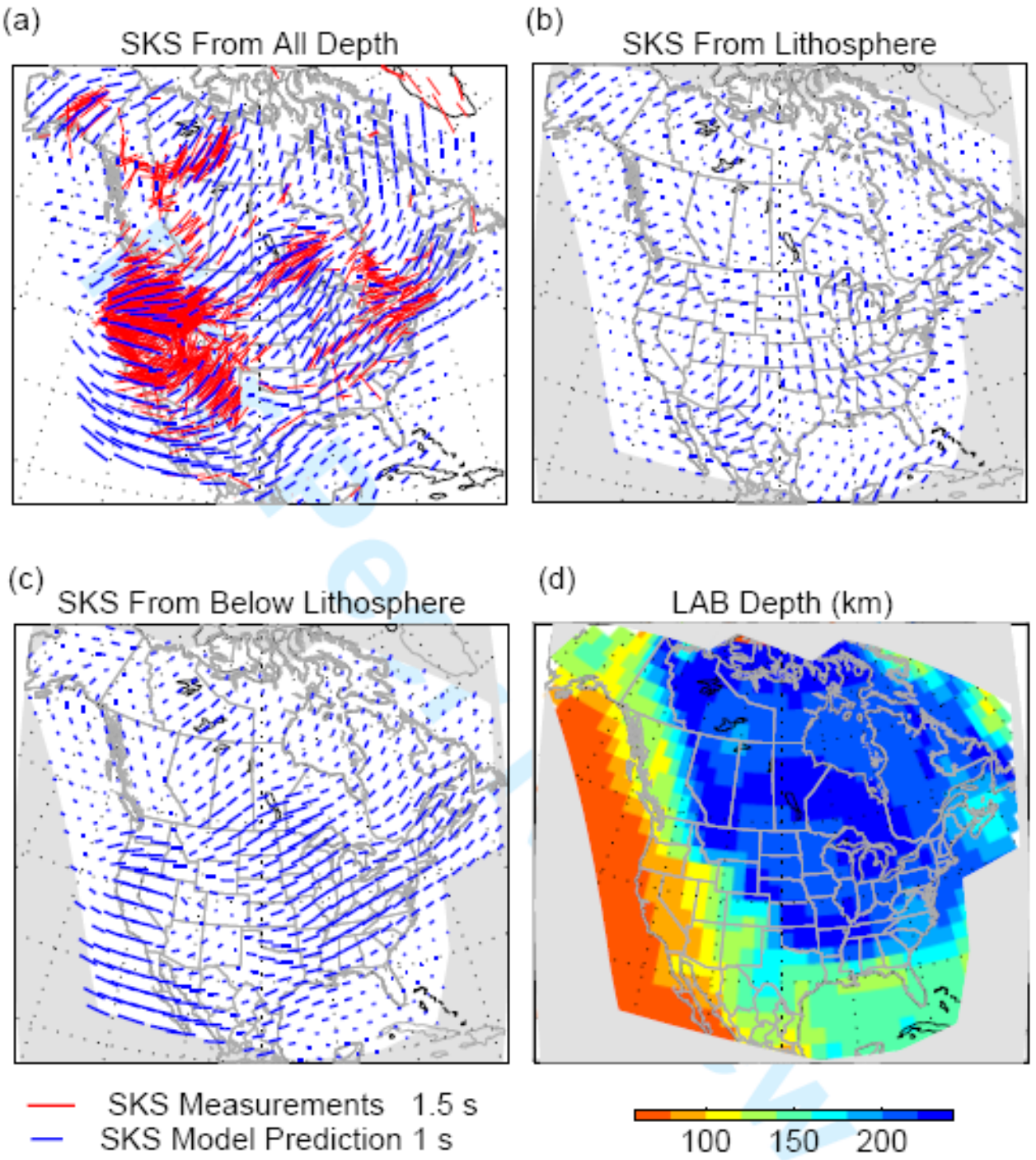
Yuan et al, in review: Isotropic SV velocity



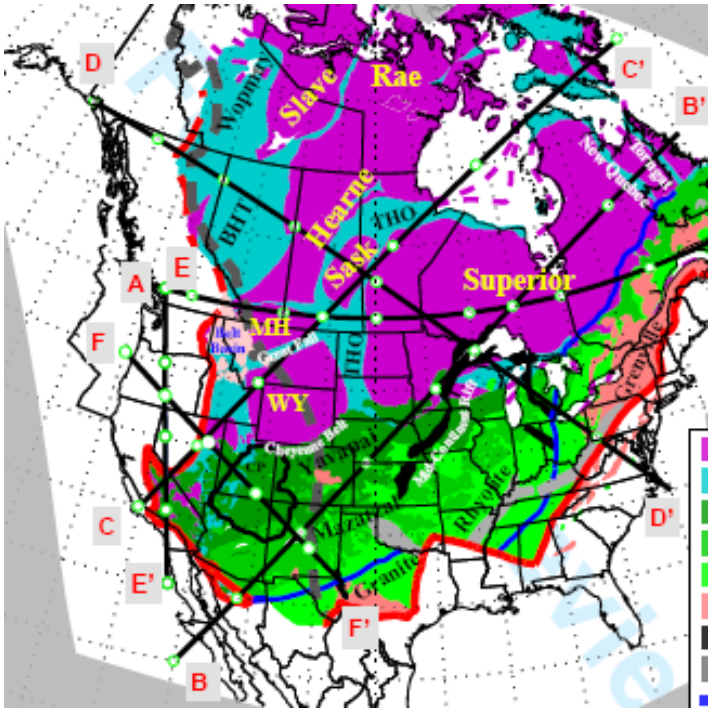
Yuan et al, in review: Azimuthal anisotropy

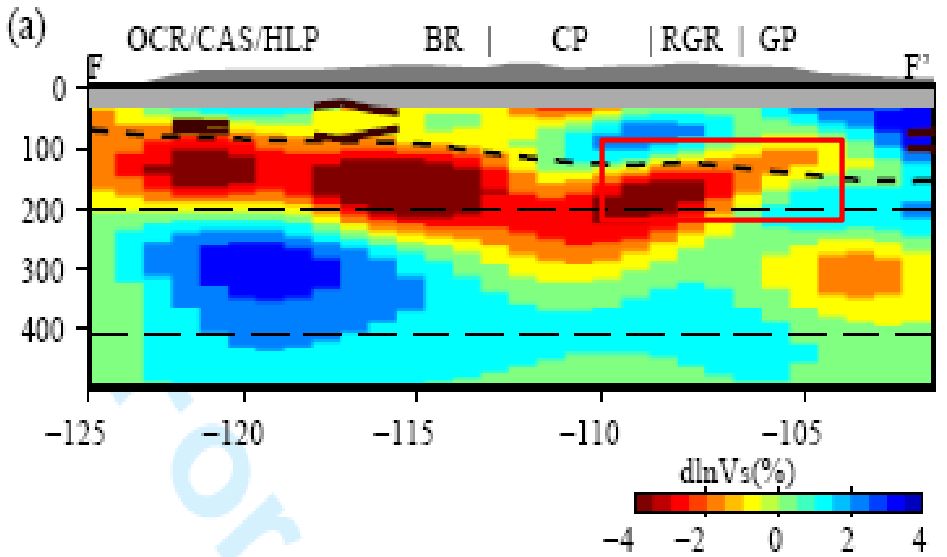


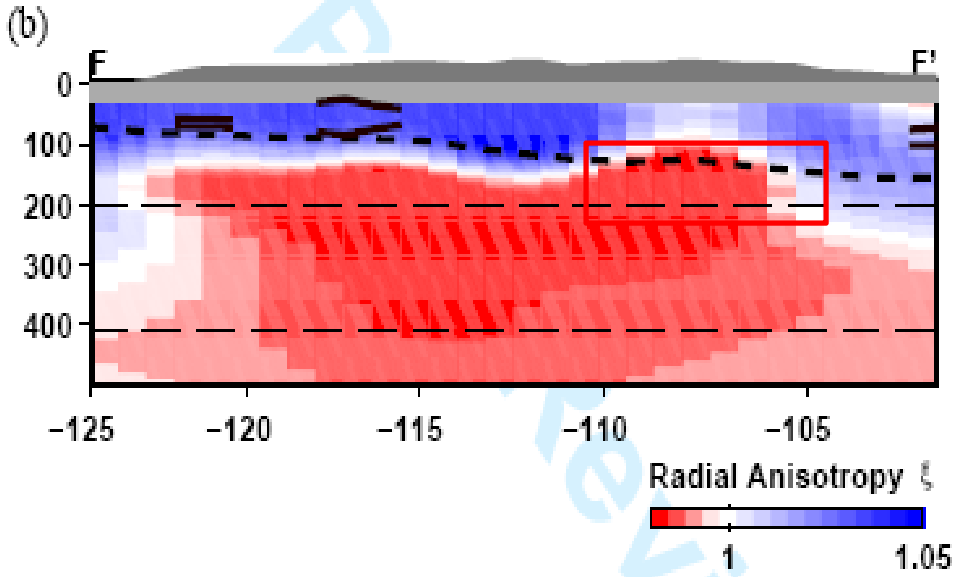
Yuan et al, in review: SV/SH parameter

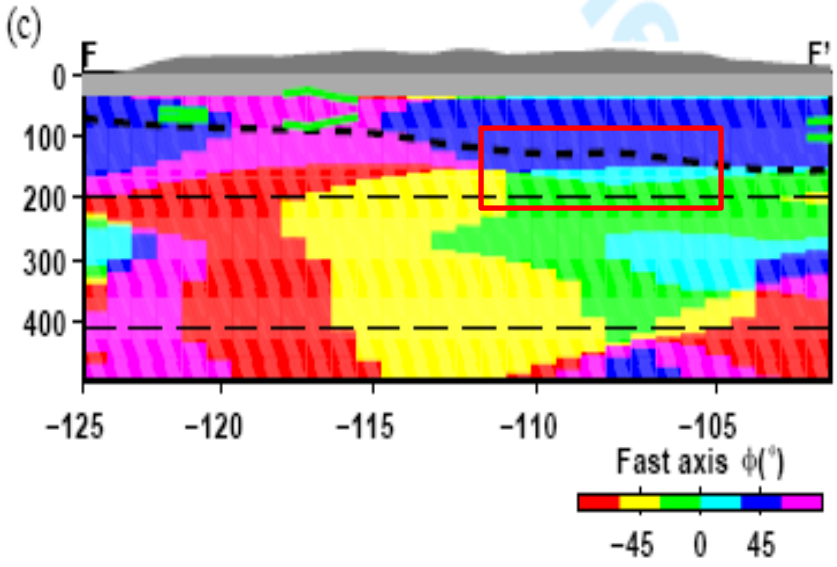


Yuan et al., in review

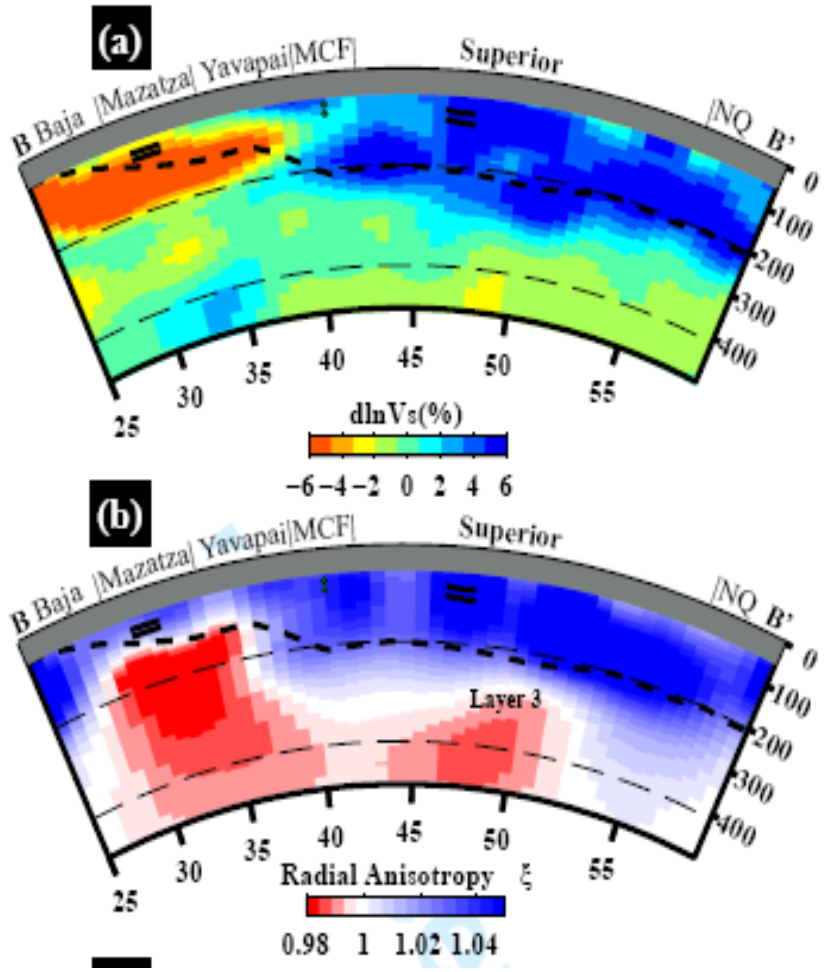


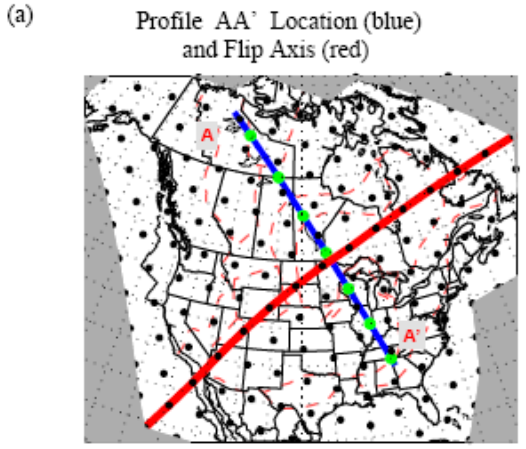






Yuan et al, In review; at Four Corners area the lithos seems about 150 km thick





Yuan et al, in review: In NE Utah a changing set of anisotropic parameters