Vp/Vs analysis for near surface data from Priddis and West campus sites.

By
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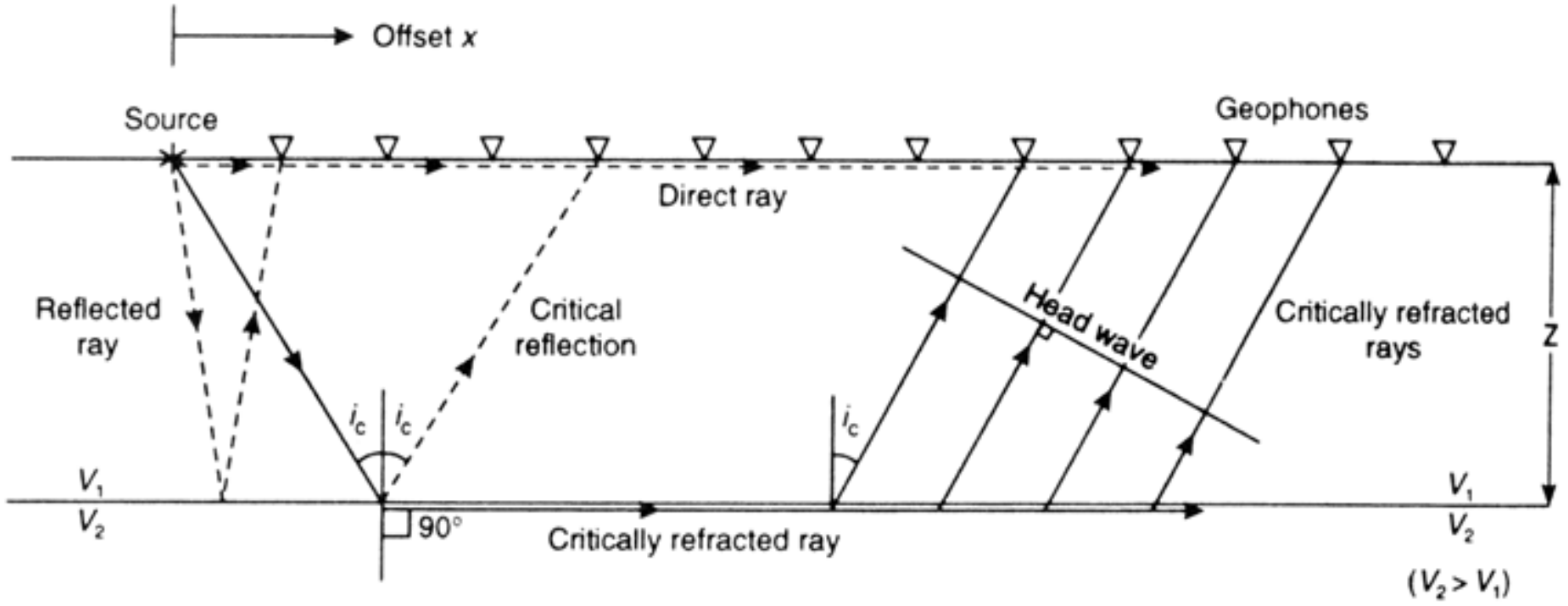
Supervisor
Dr. Don Lawton

Outline

- Refraction Concept
- Calculations
- Survey Set Up
- West Campus Survey
- Priddis Survey
- Summary and Acknowledgments

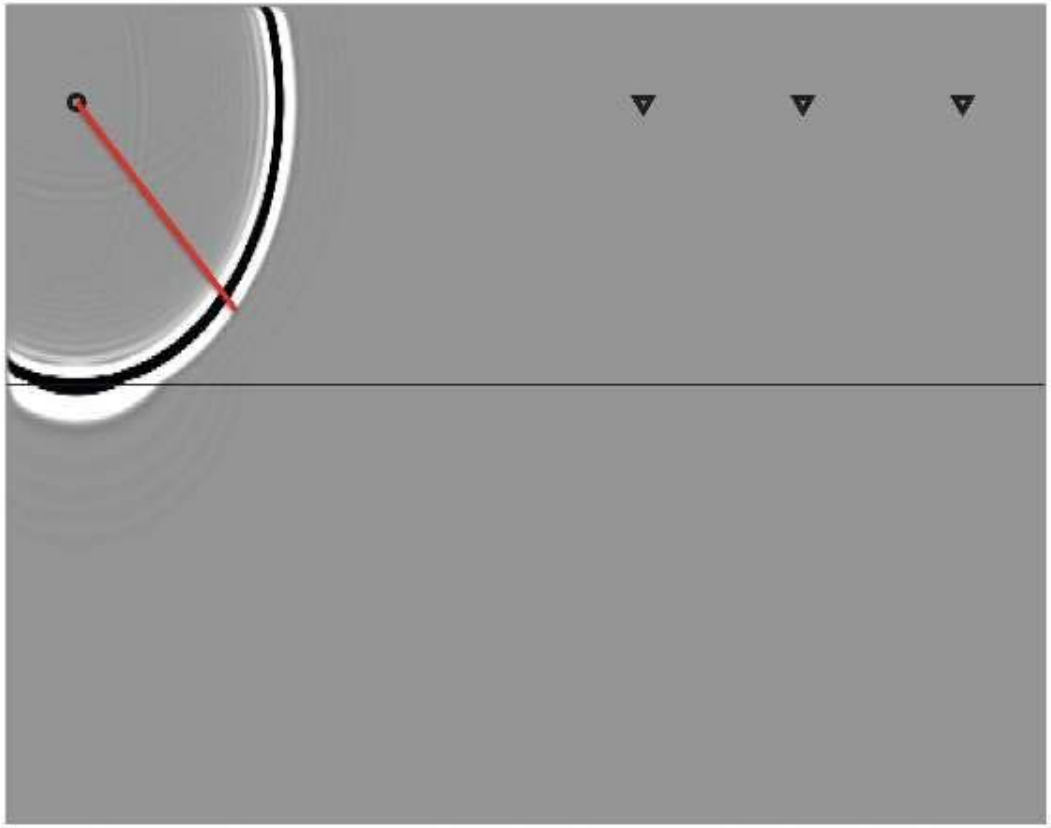
Refraction

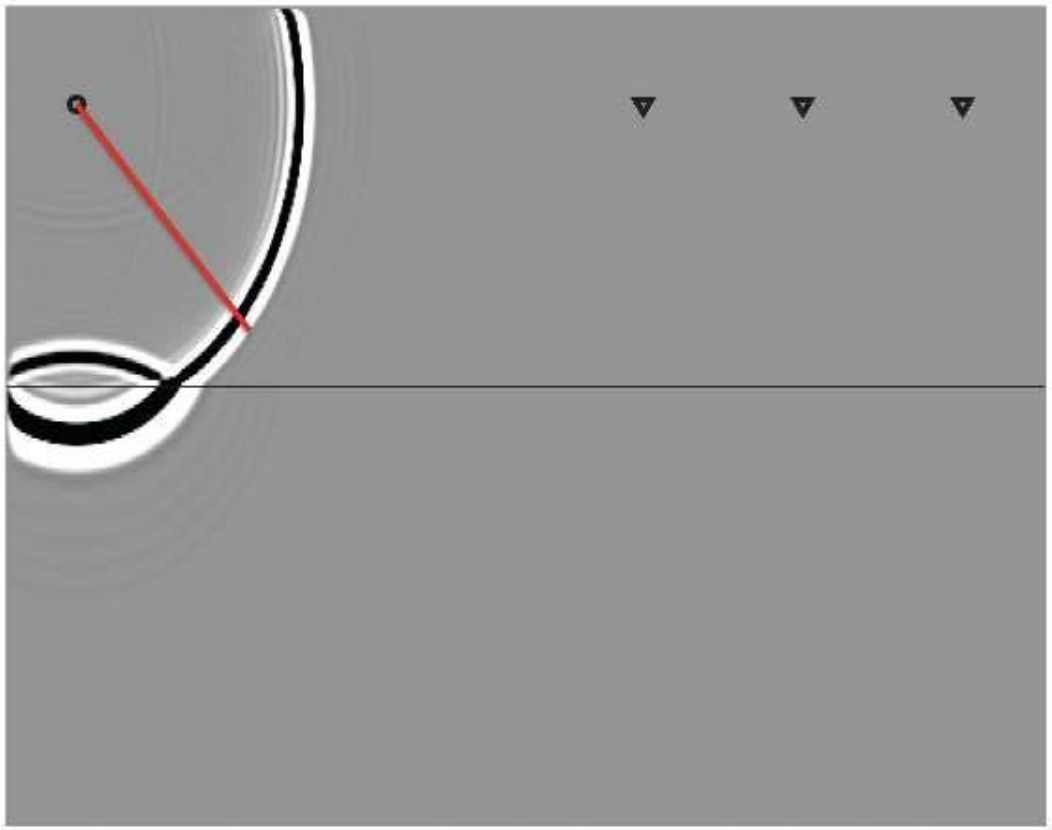


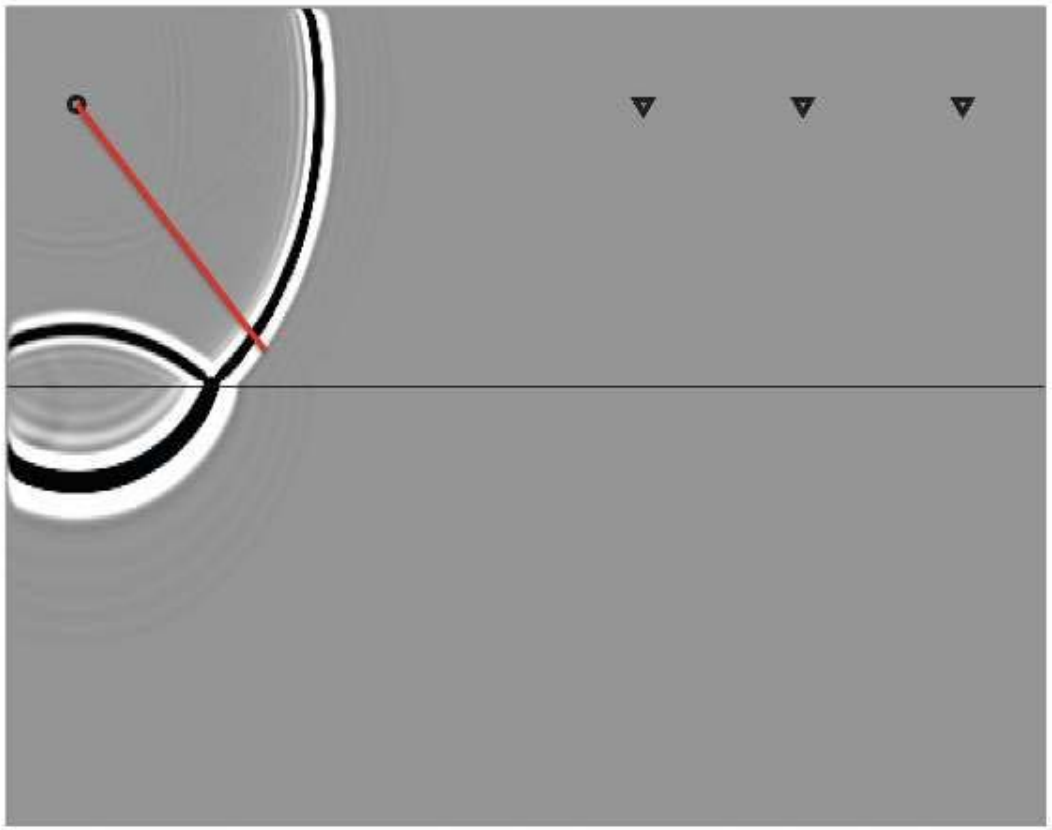
(www.geo.cornell.edu/geology/.../**Seismic**%20**Refraction**%2007.**ppt**)

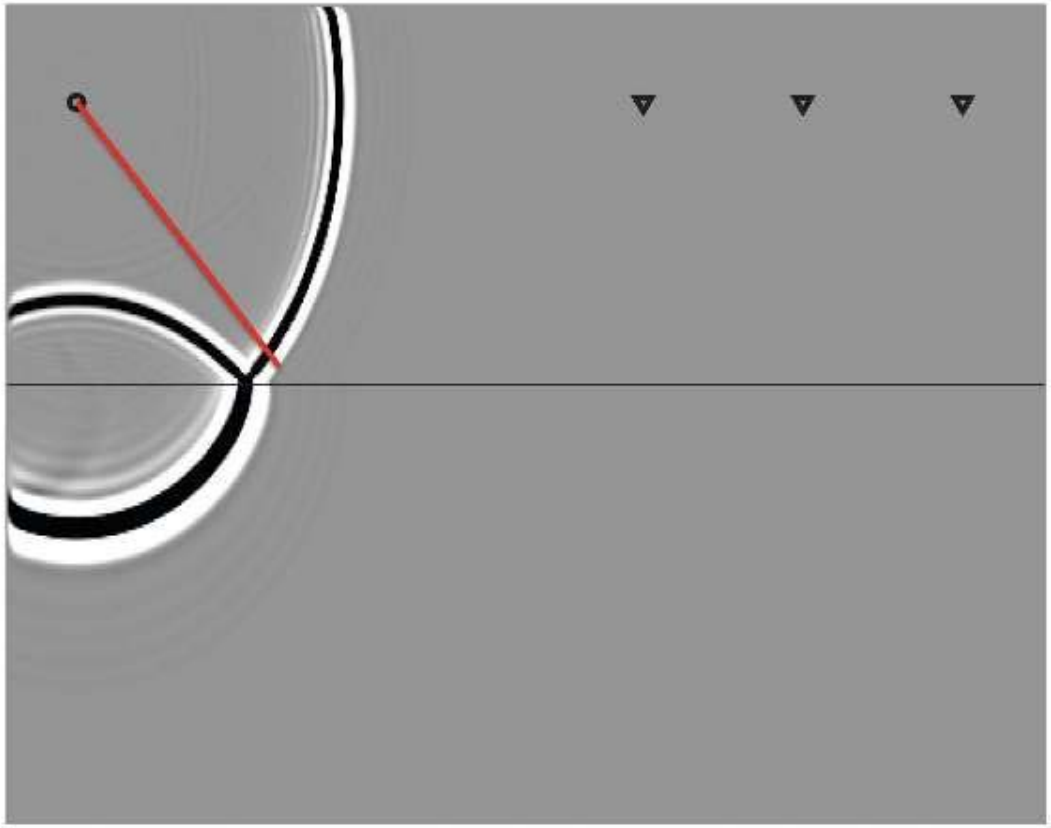
Drawing refracted rays by following wave fronts

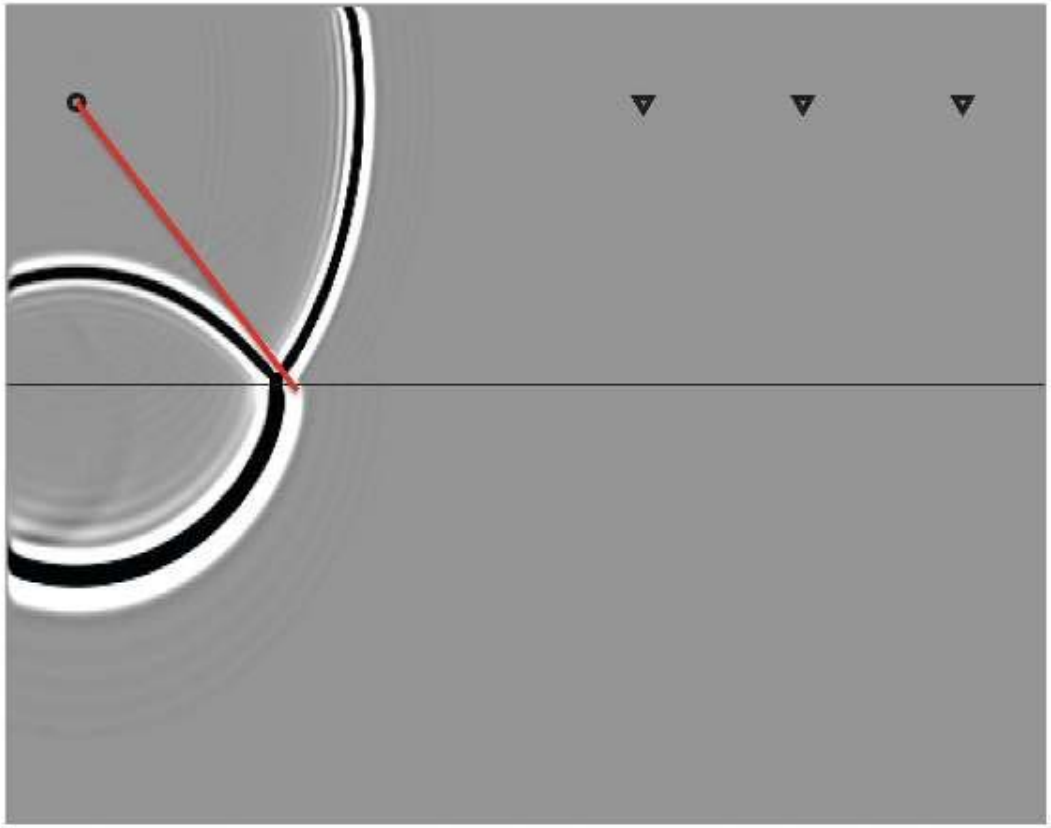
Source: K. Innanen Goph 355 Notes

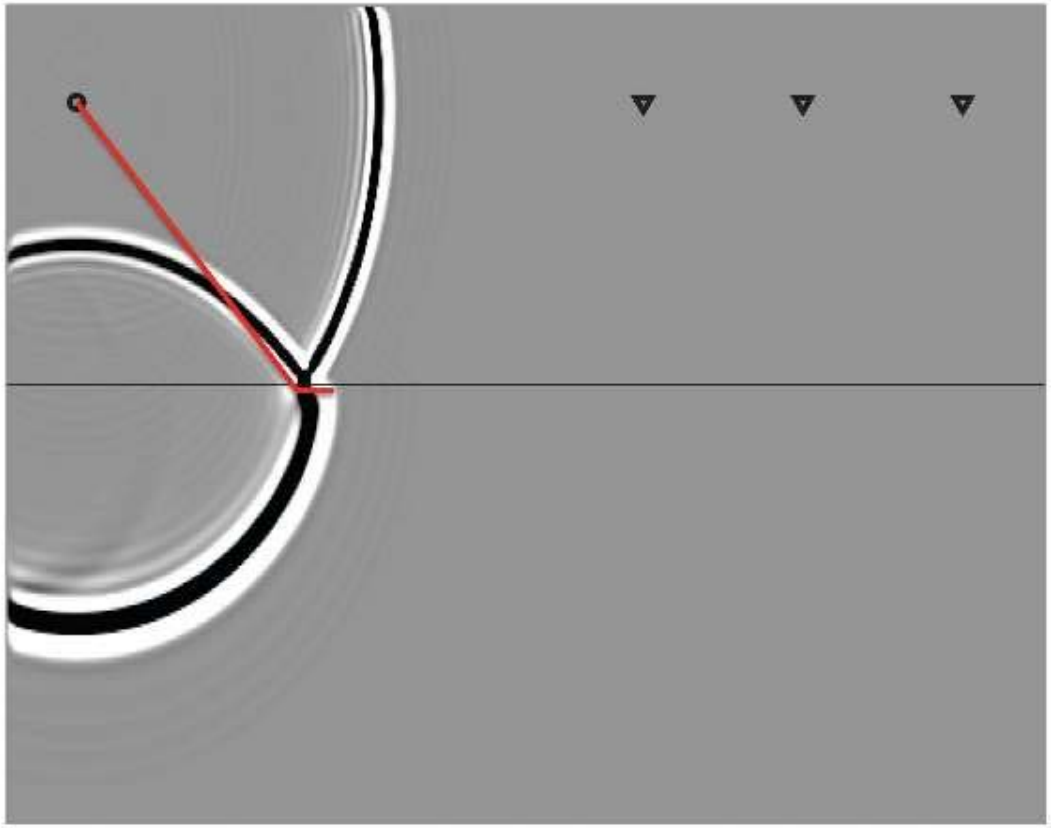


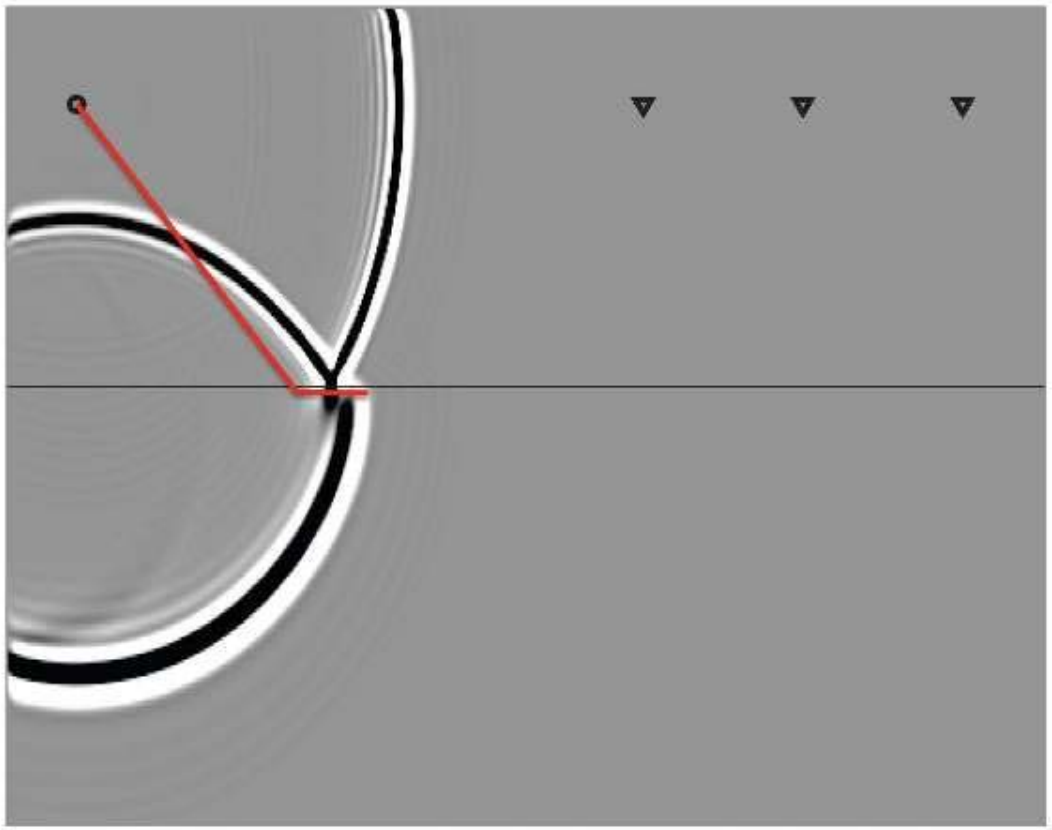


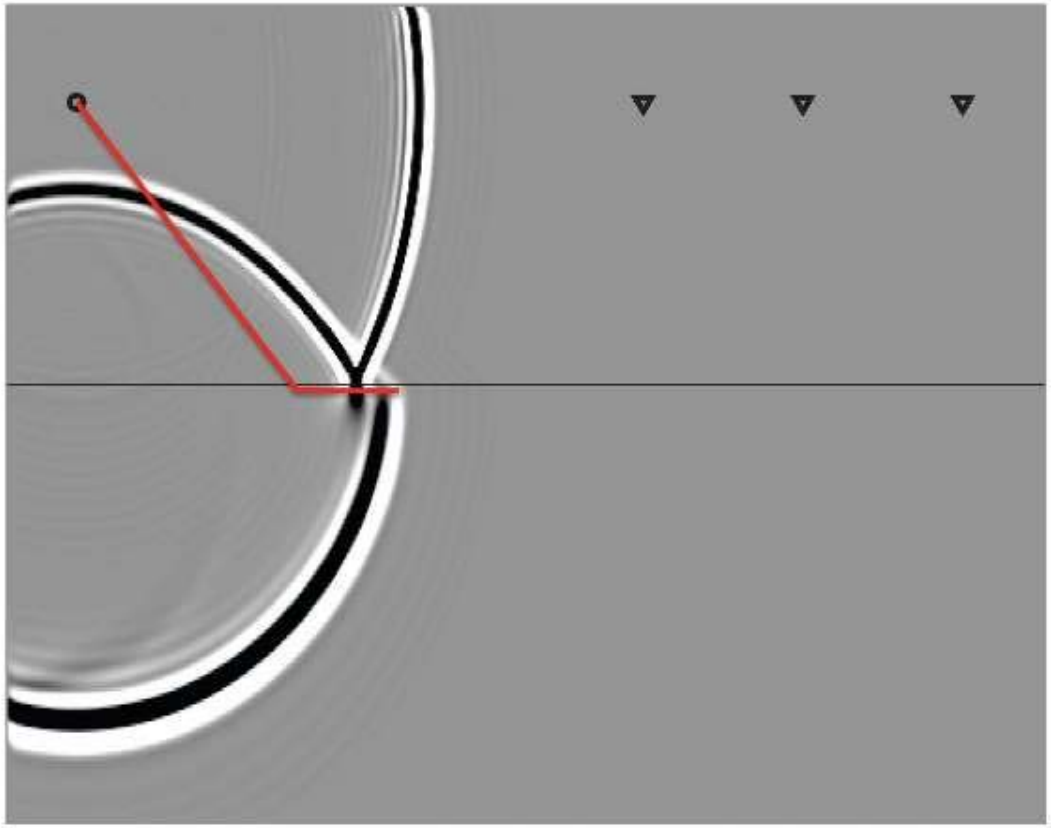


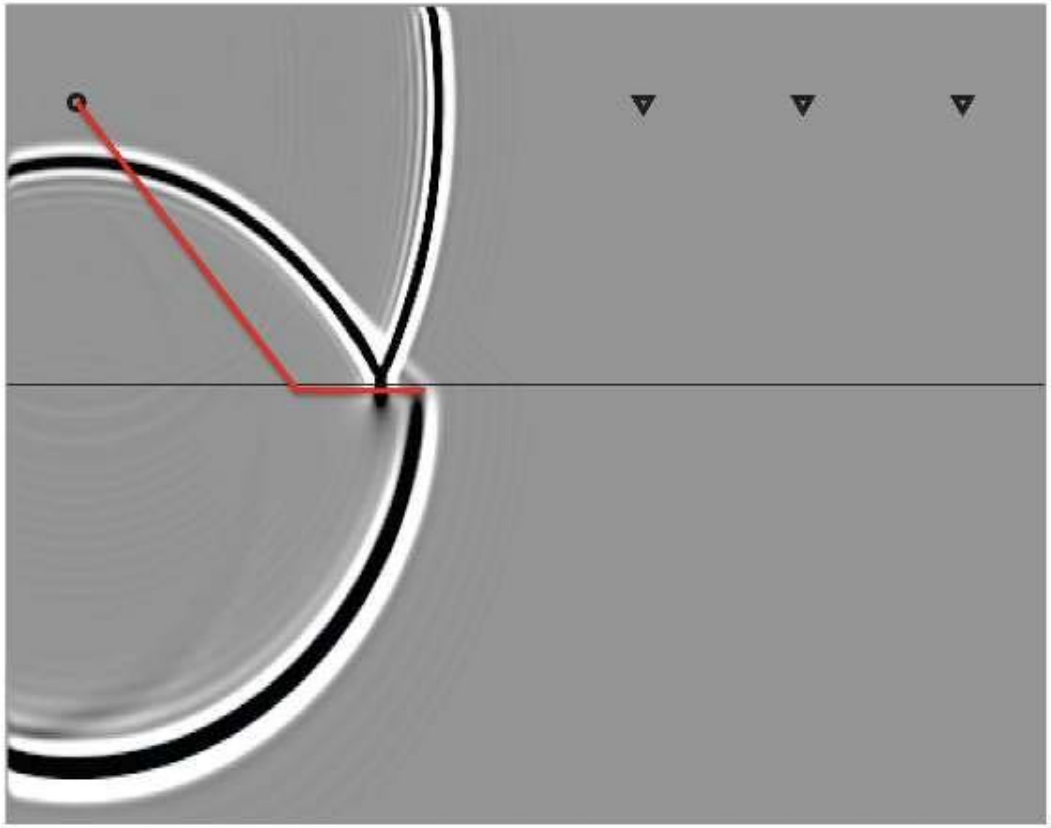


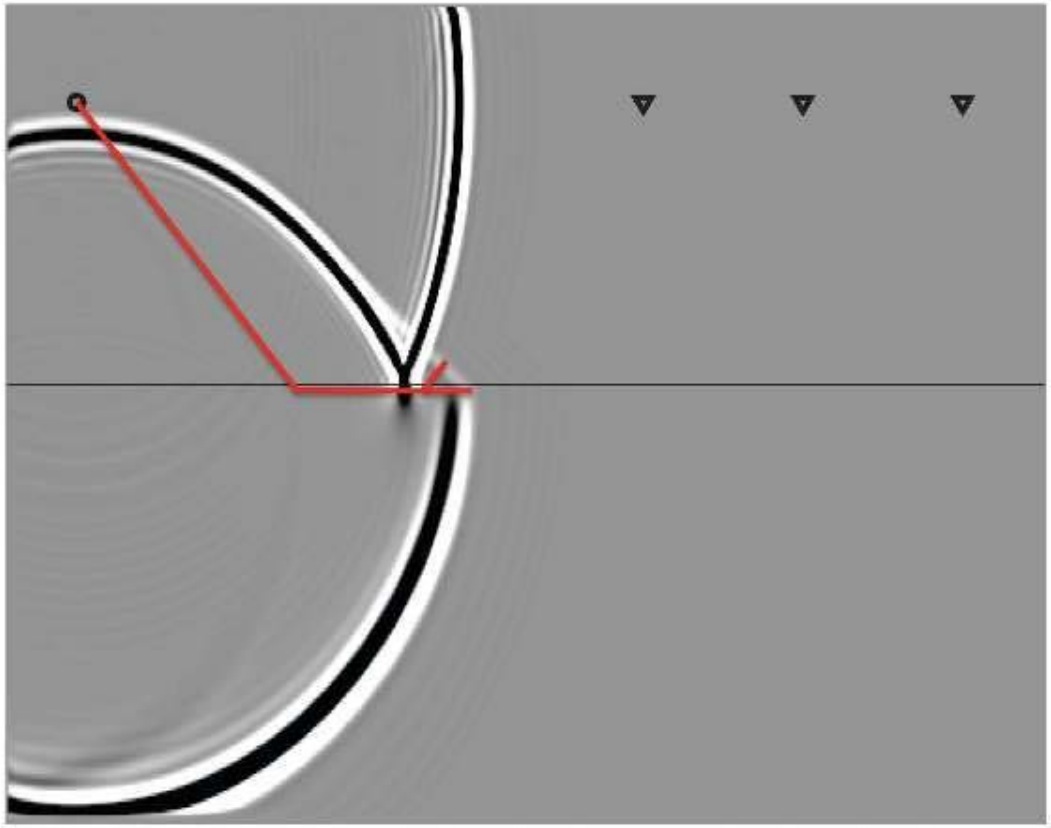


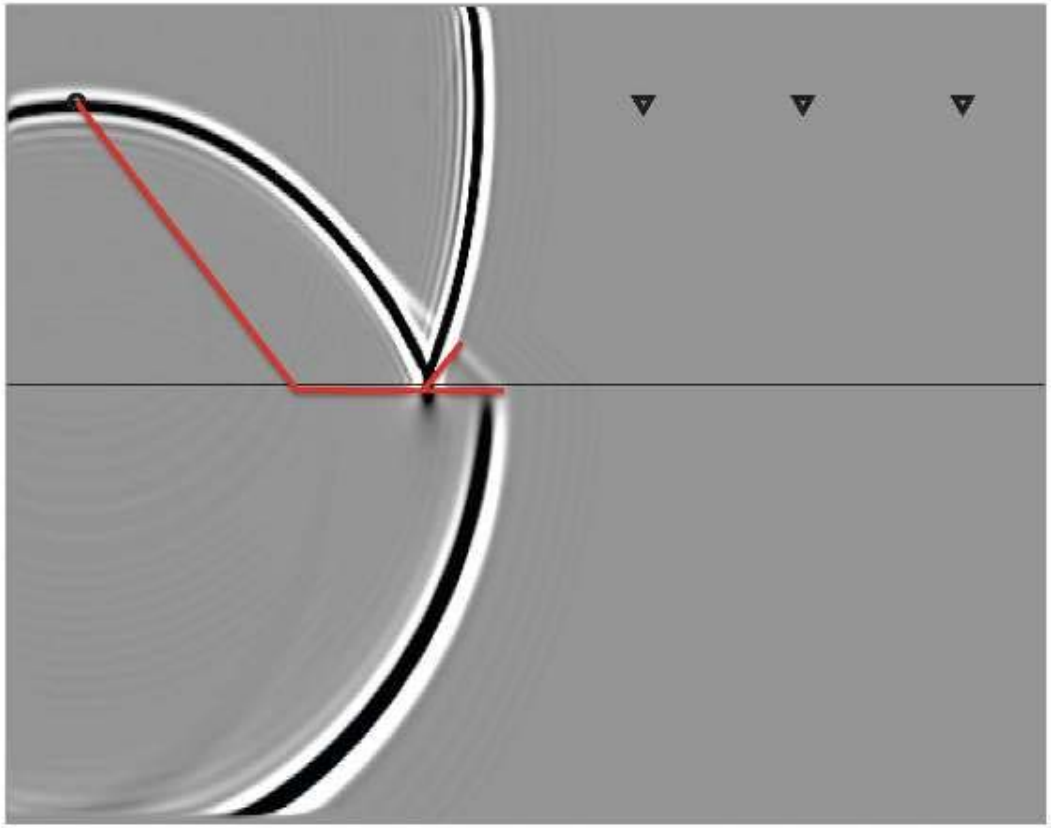


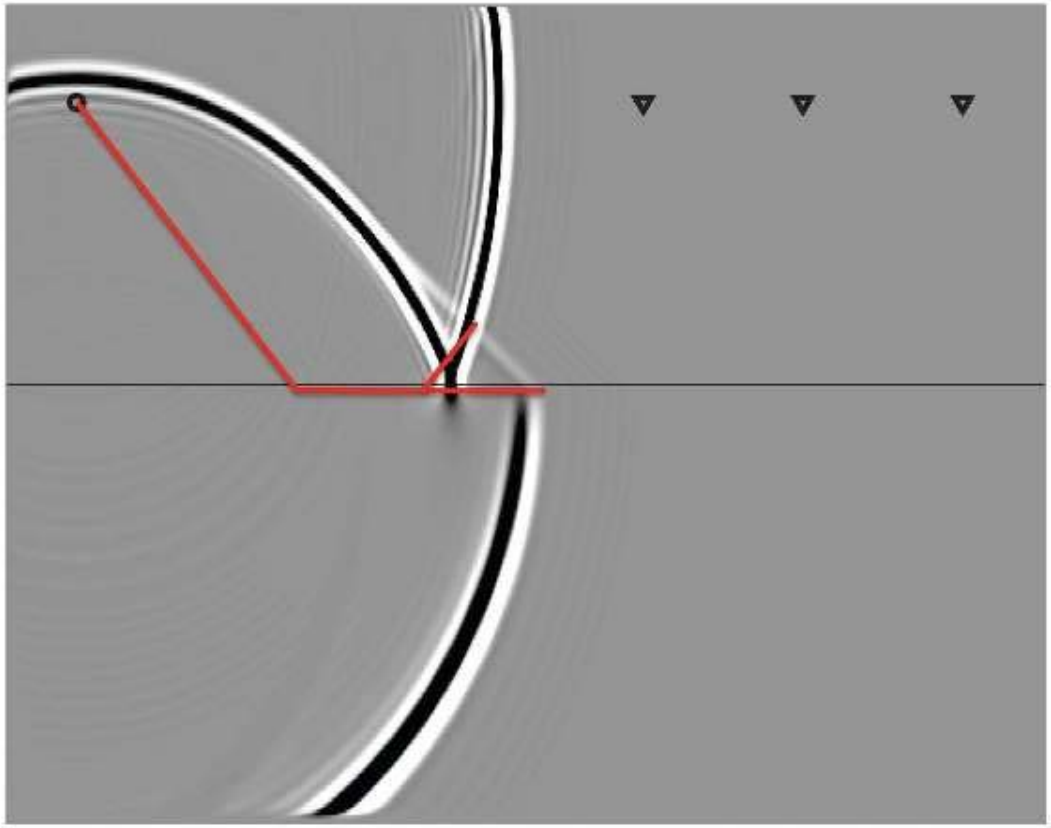


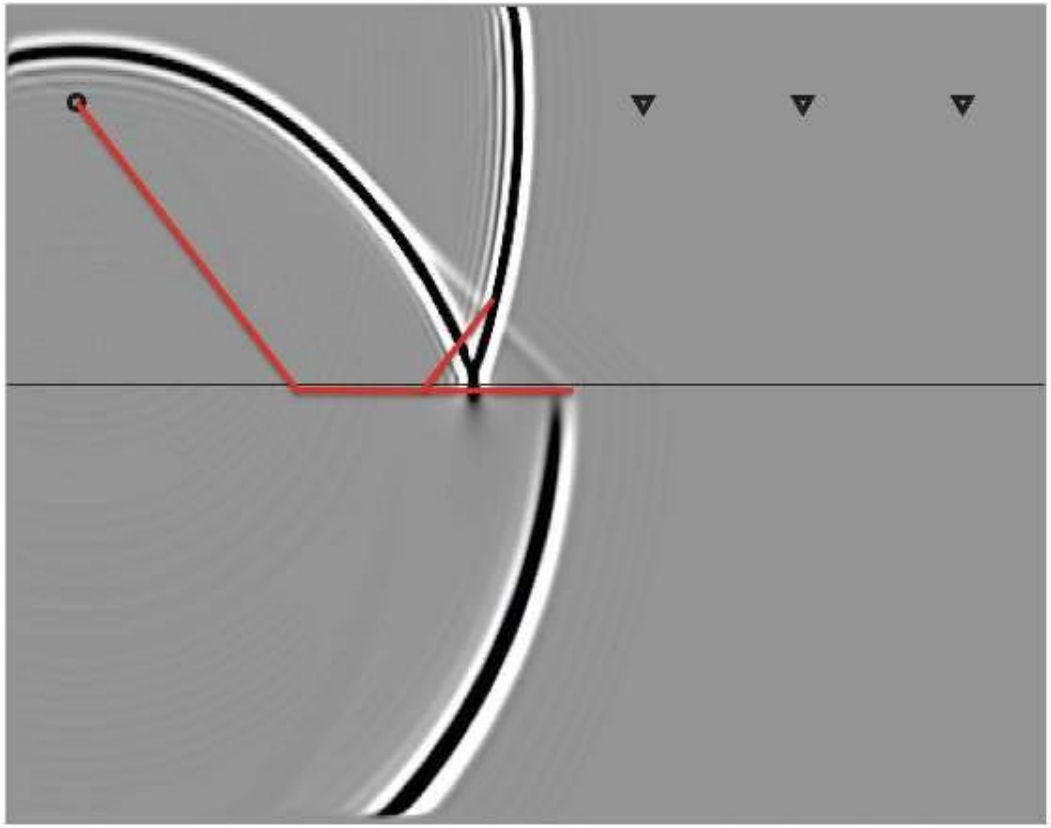


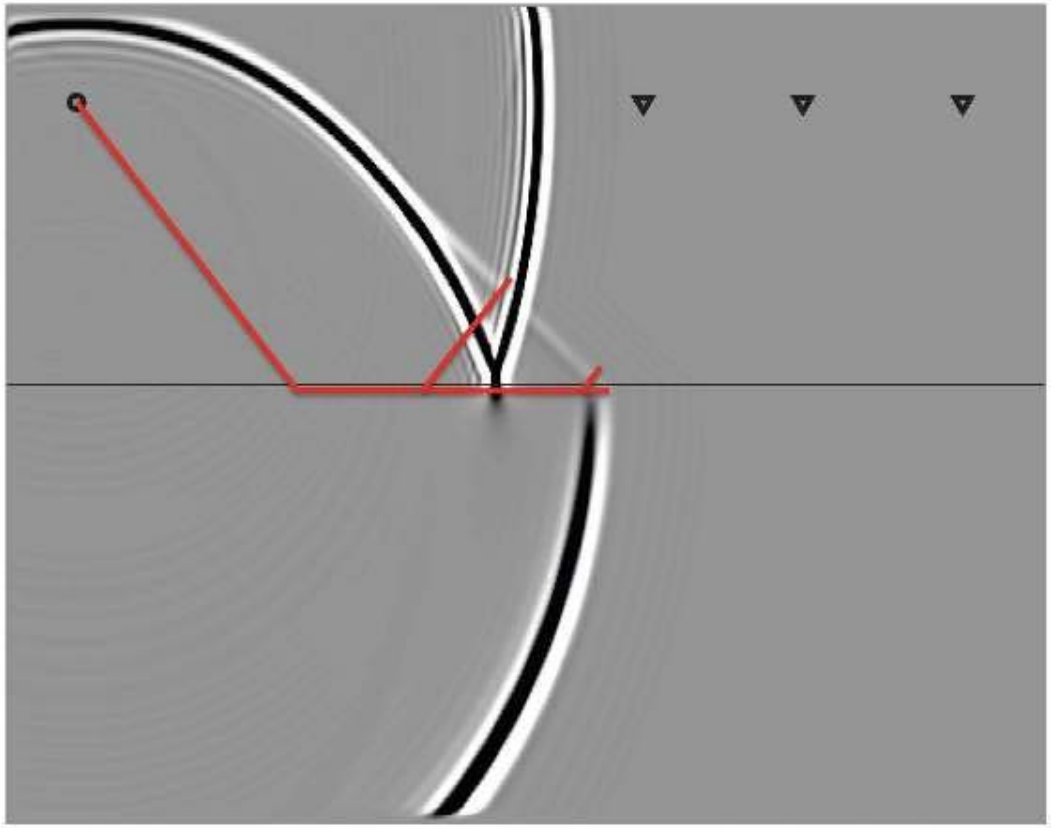


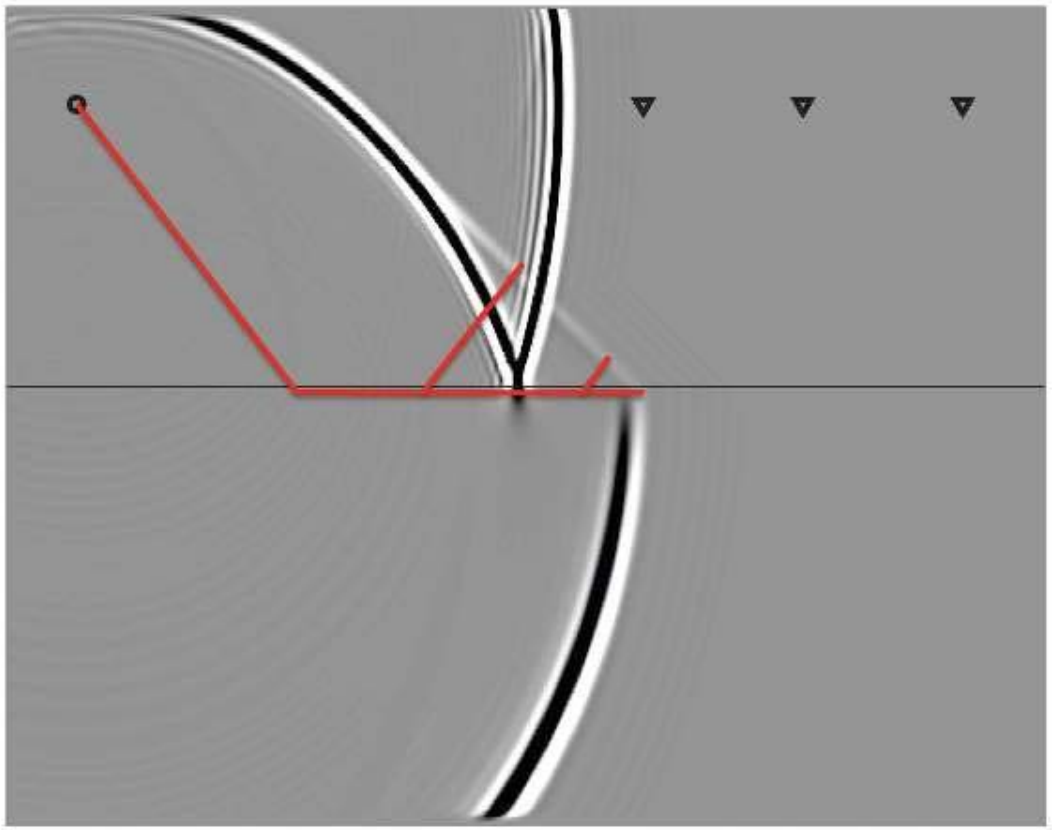


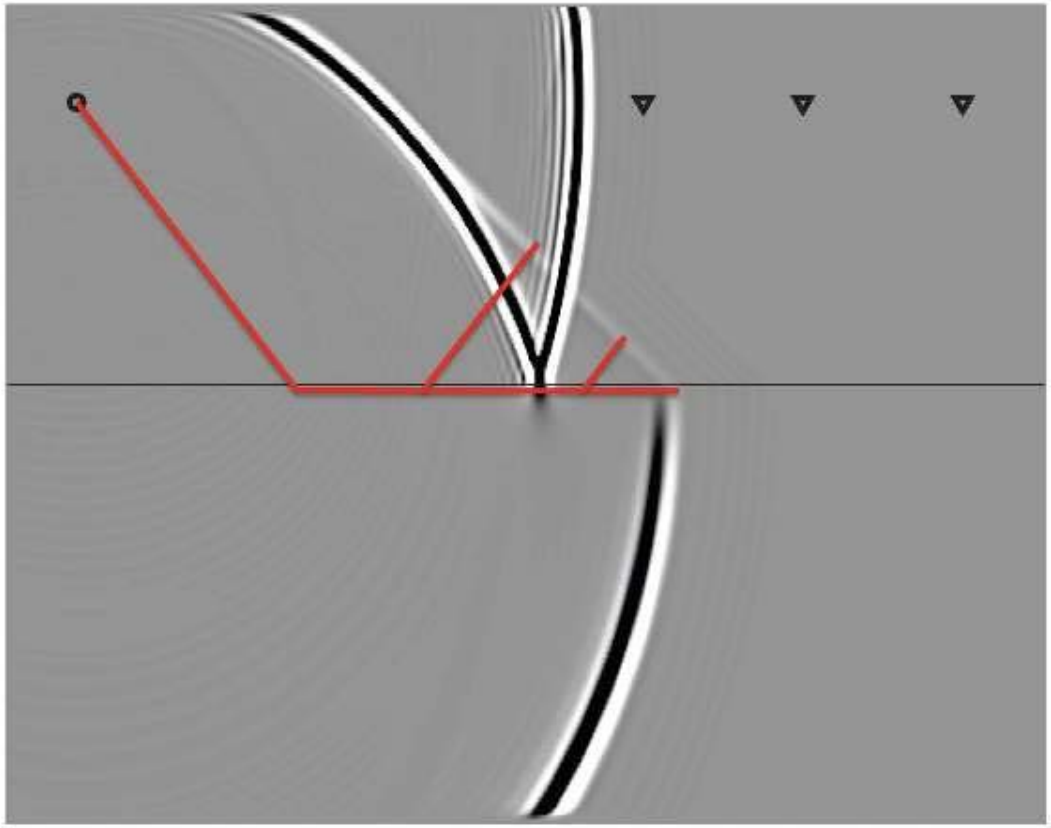


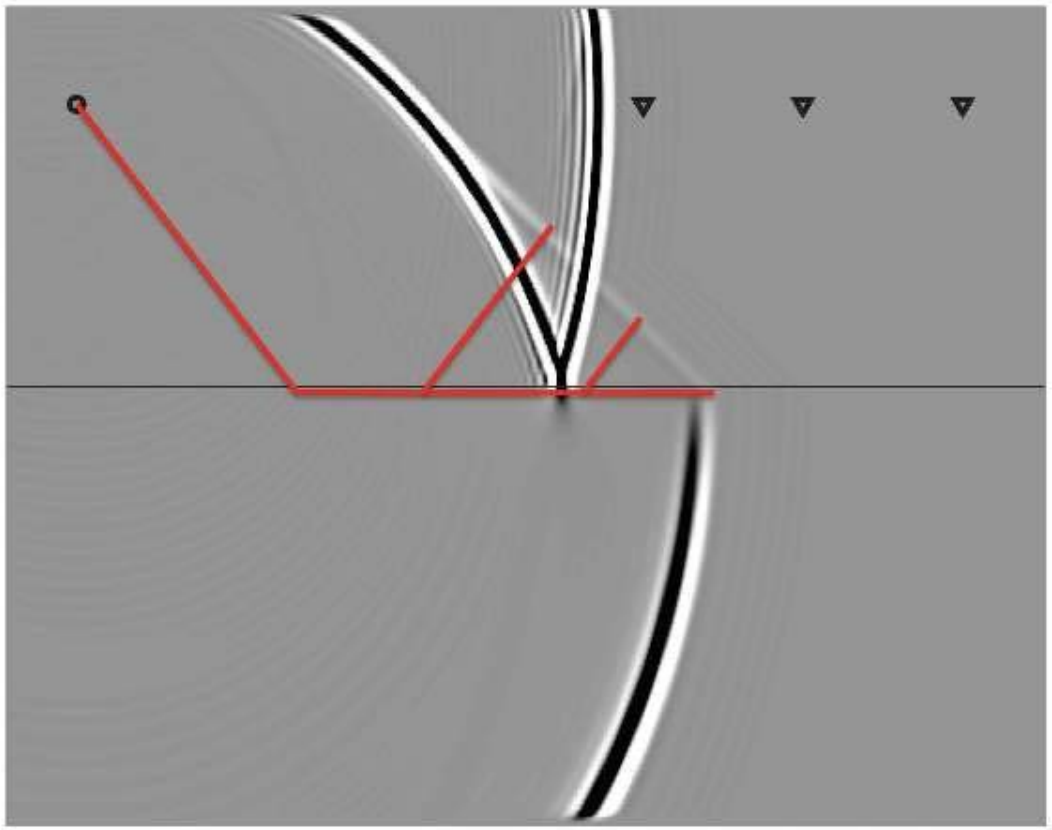


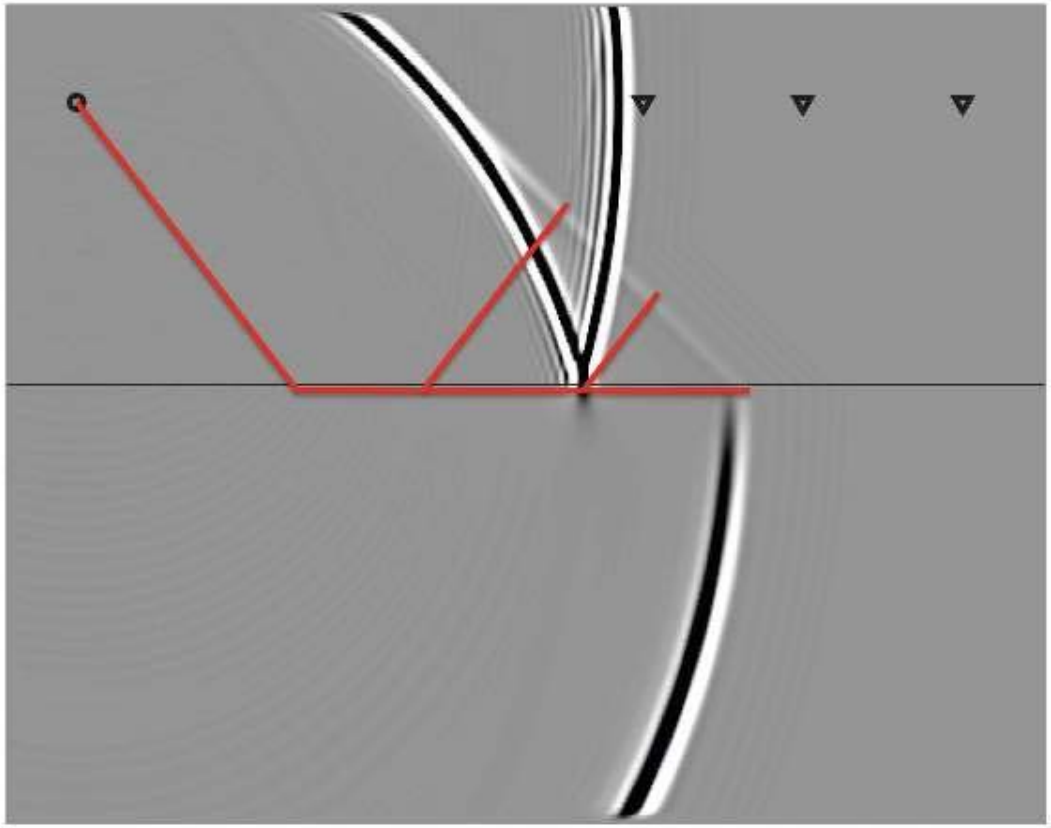


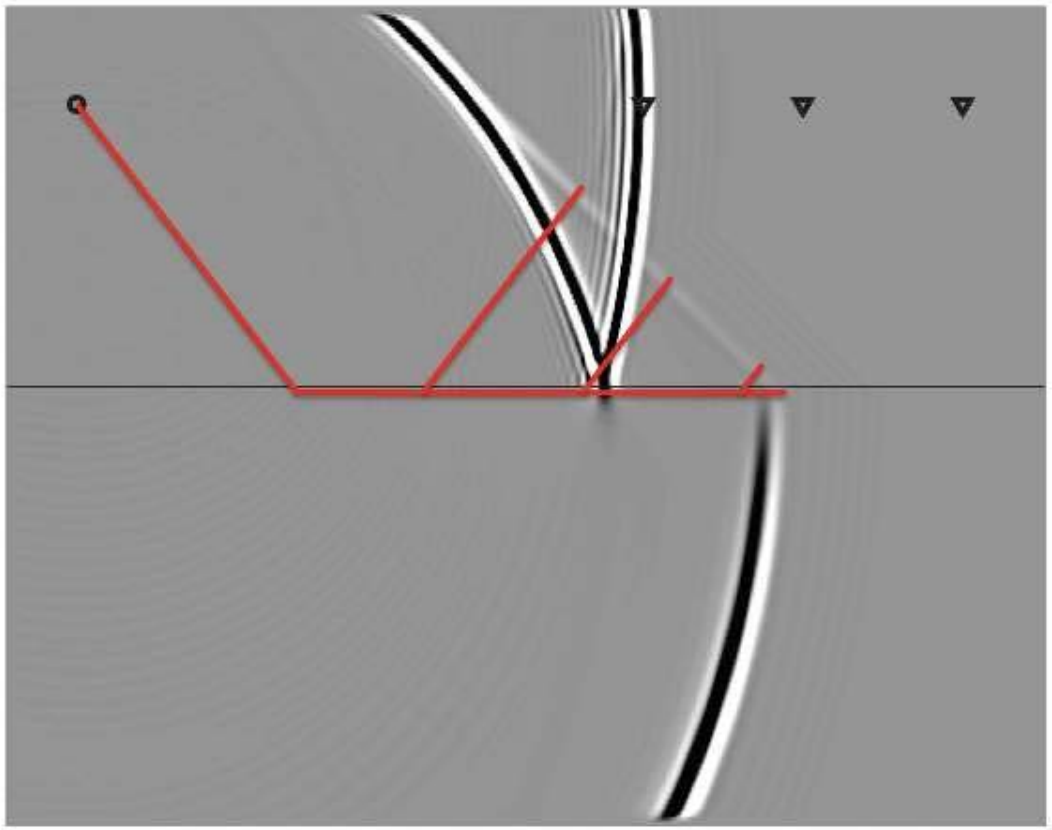


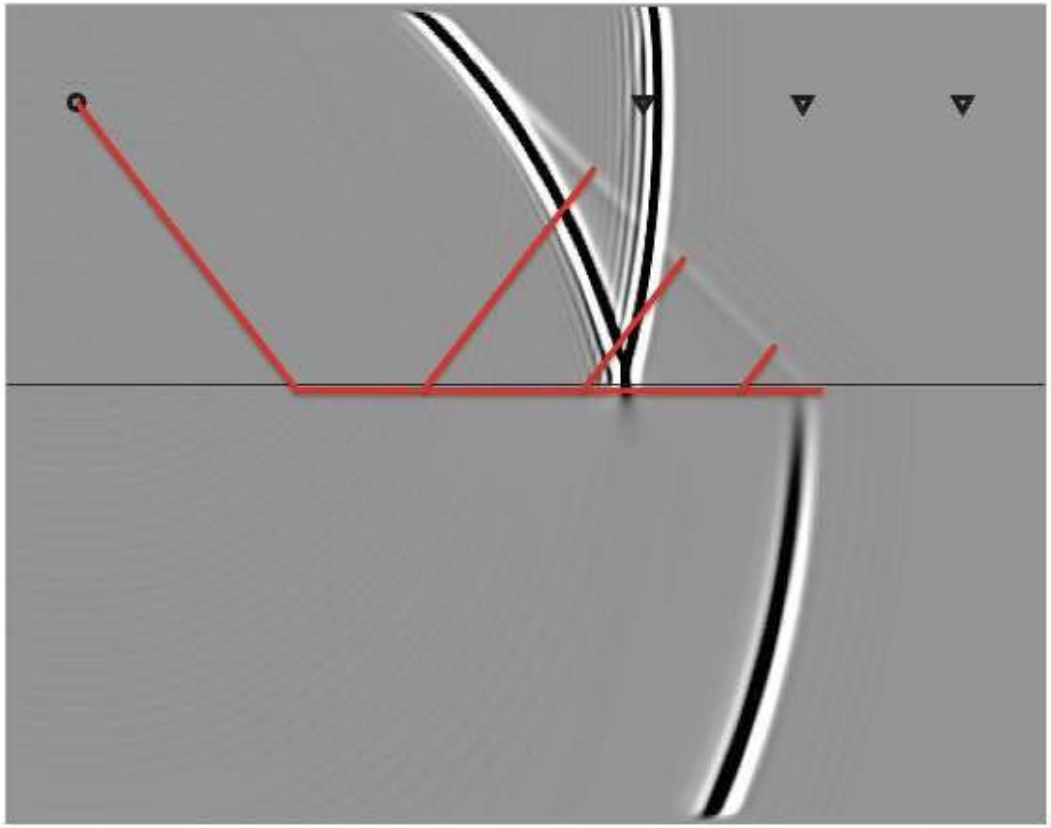


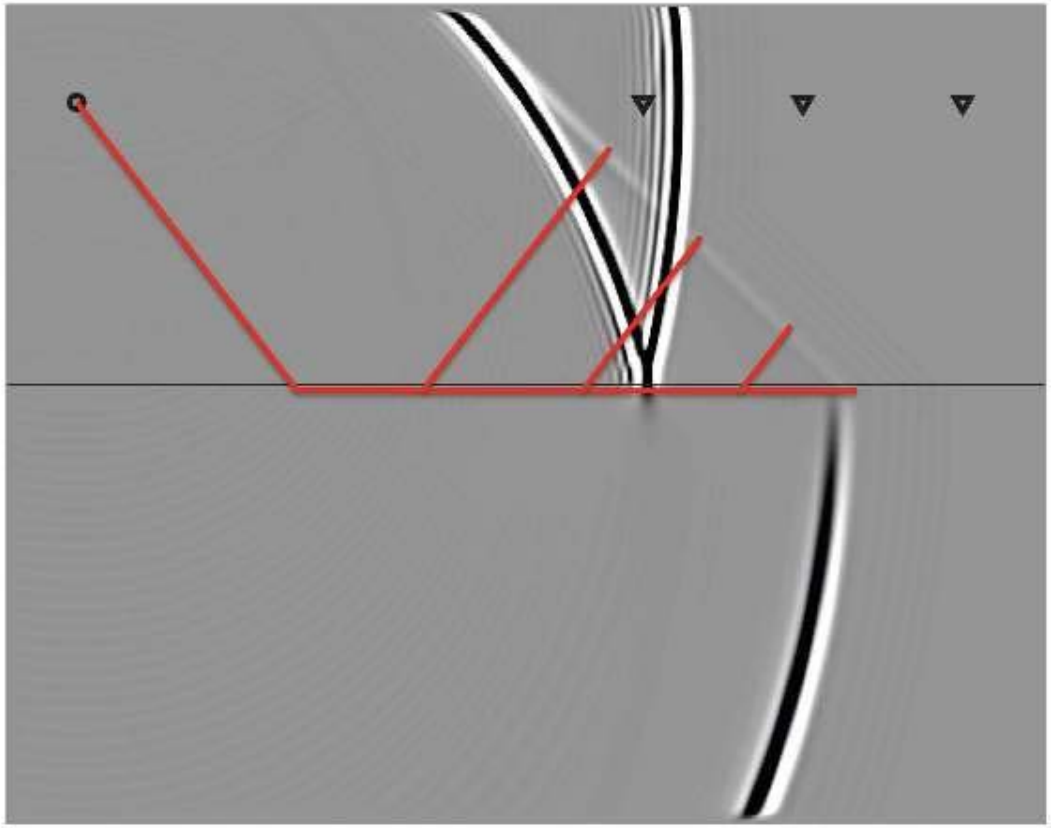


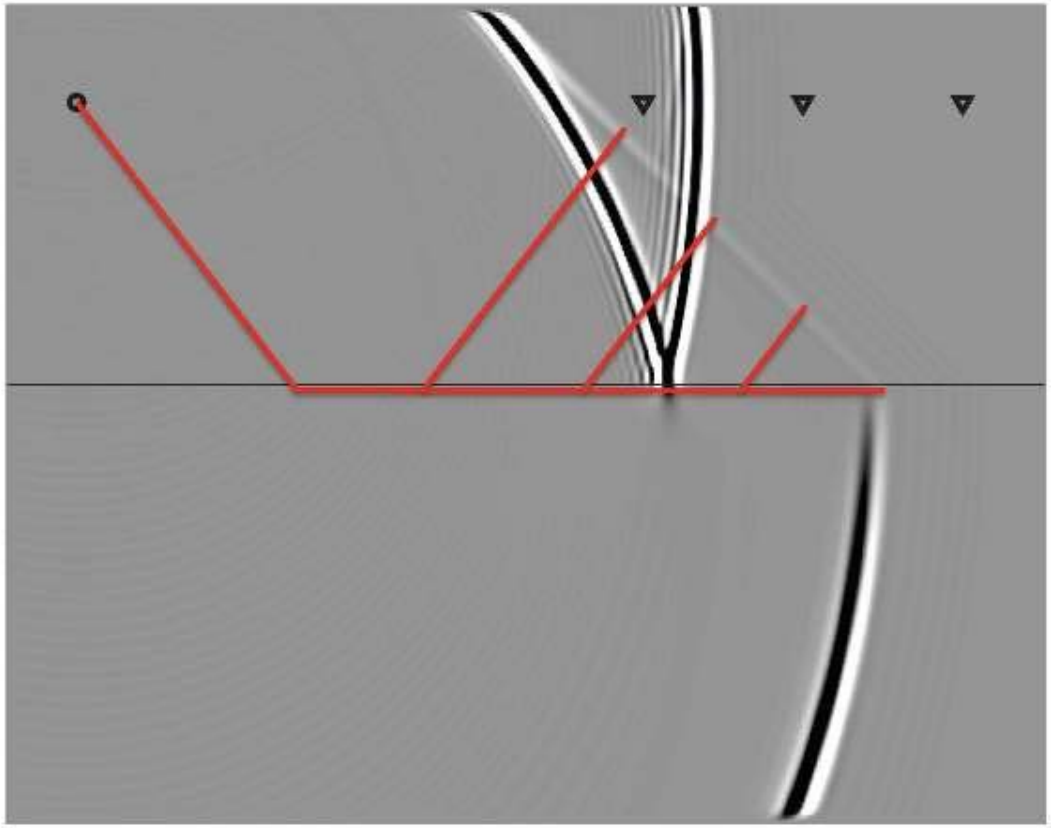


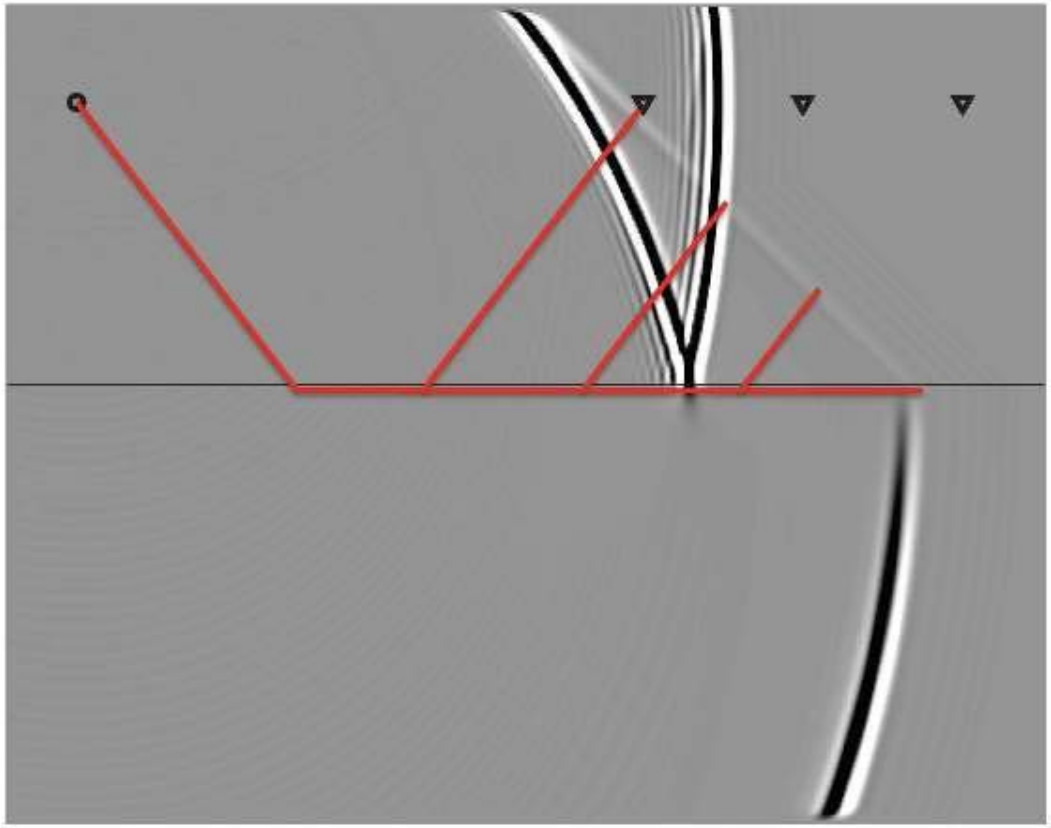


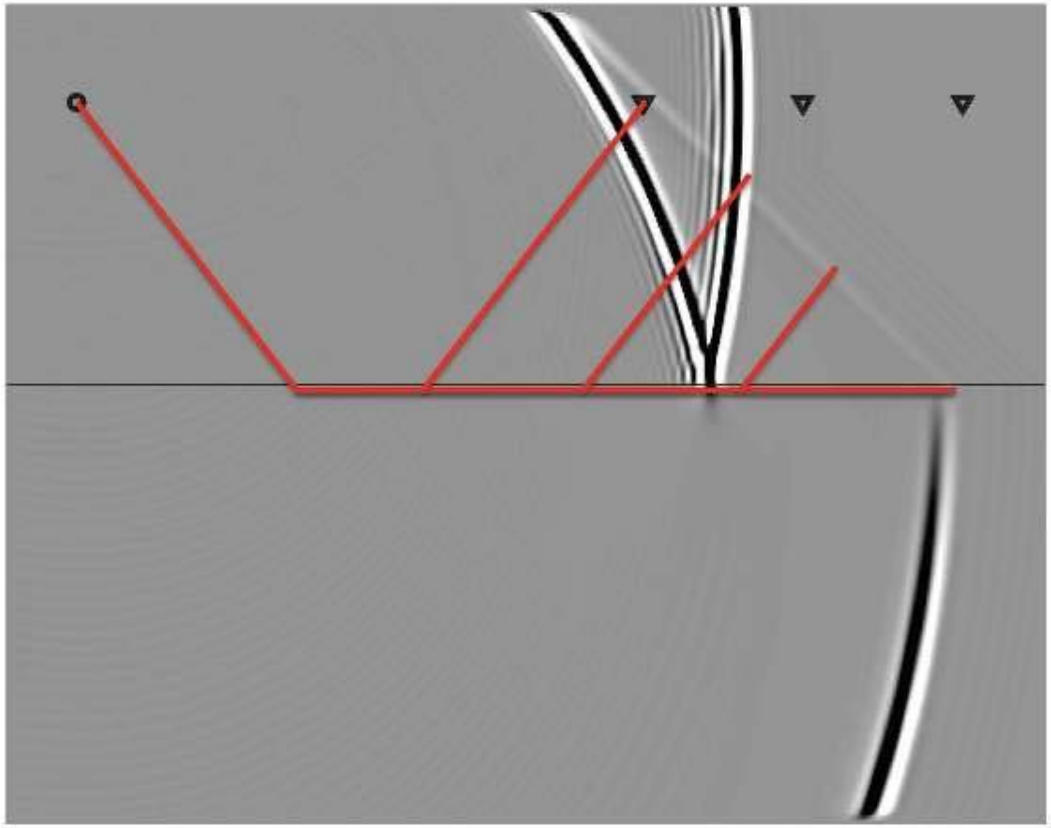


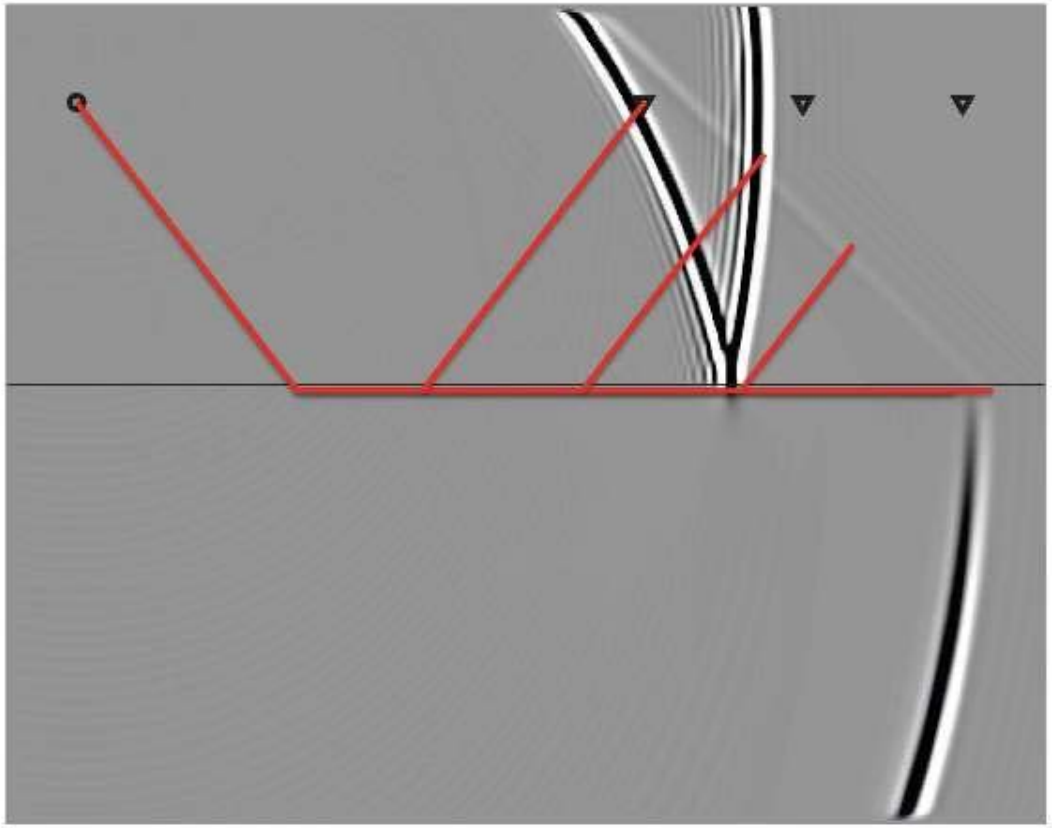


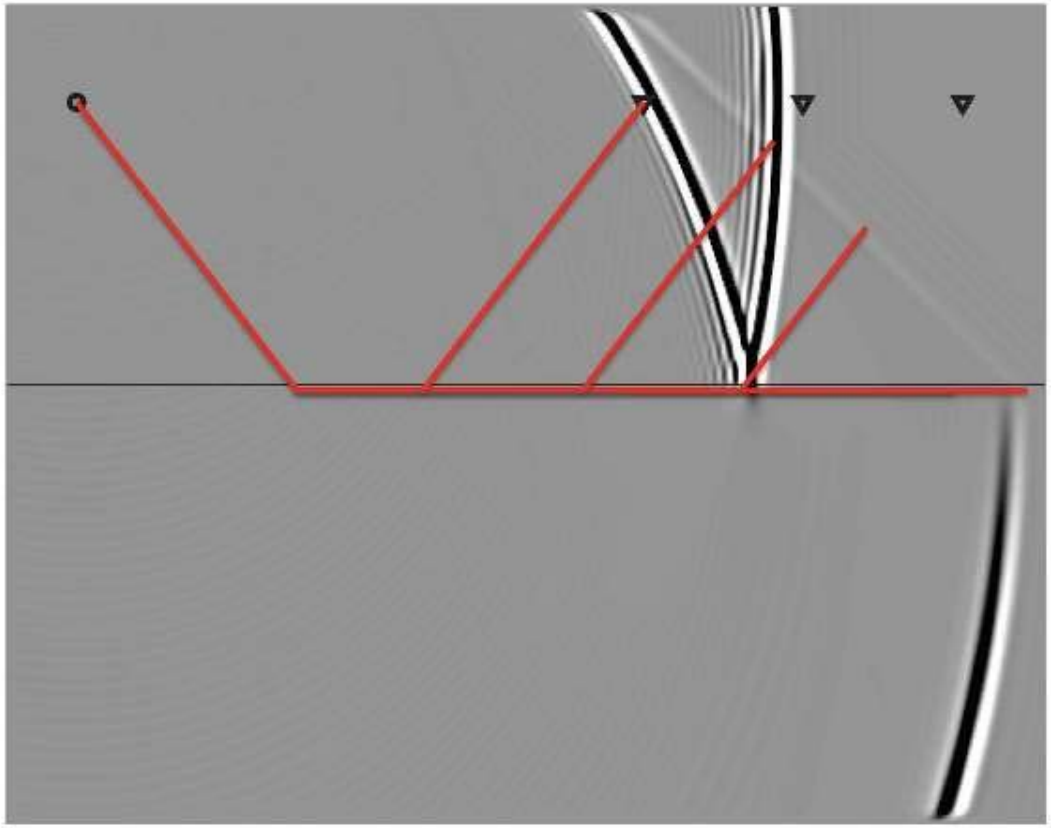


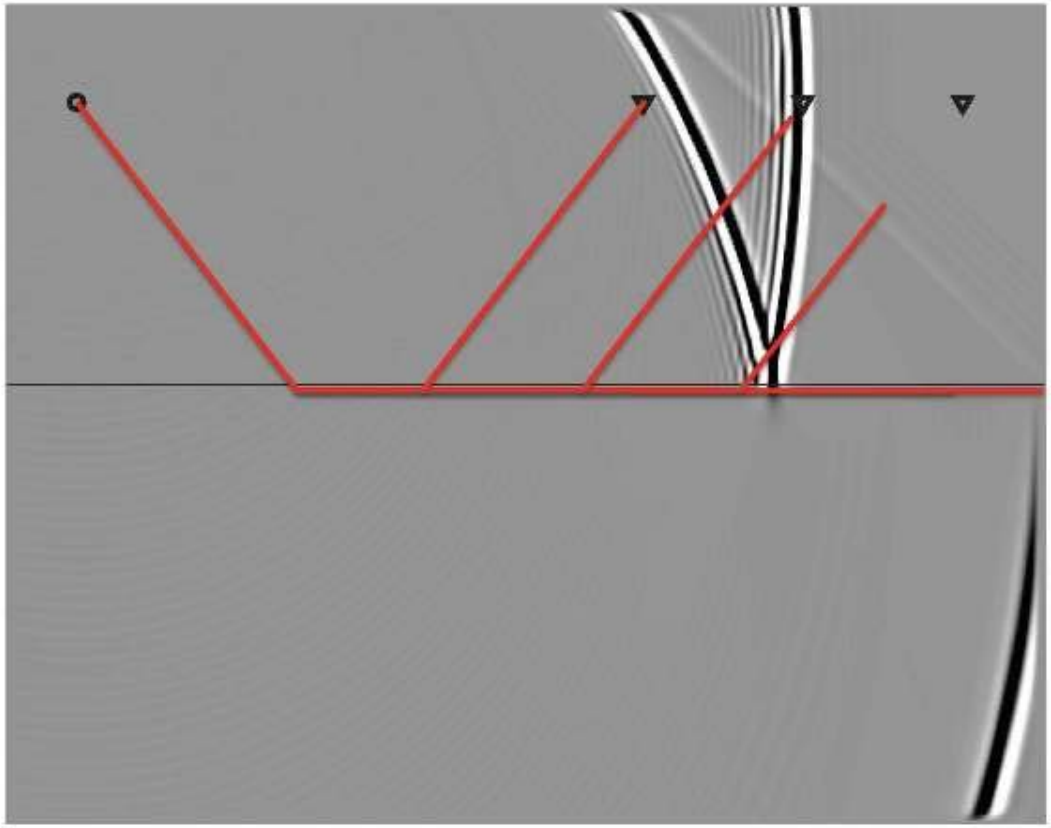


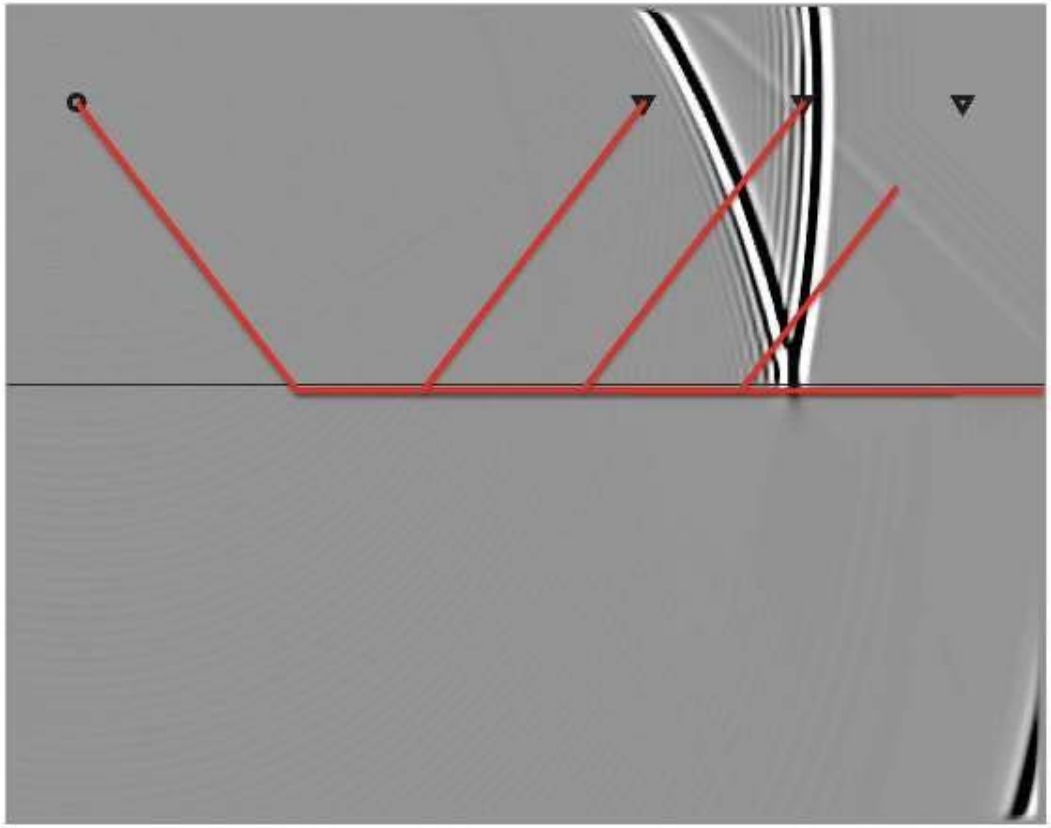


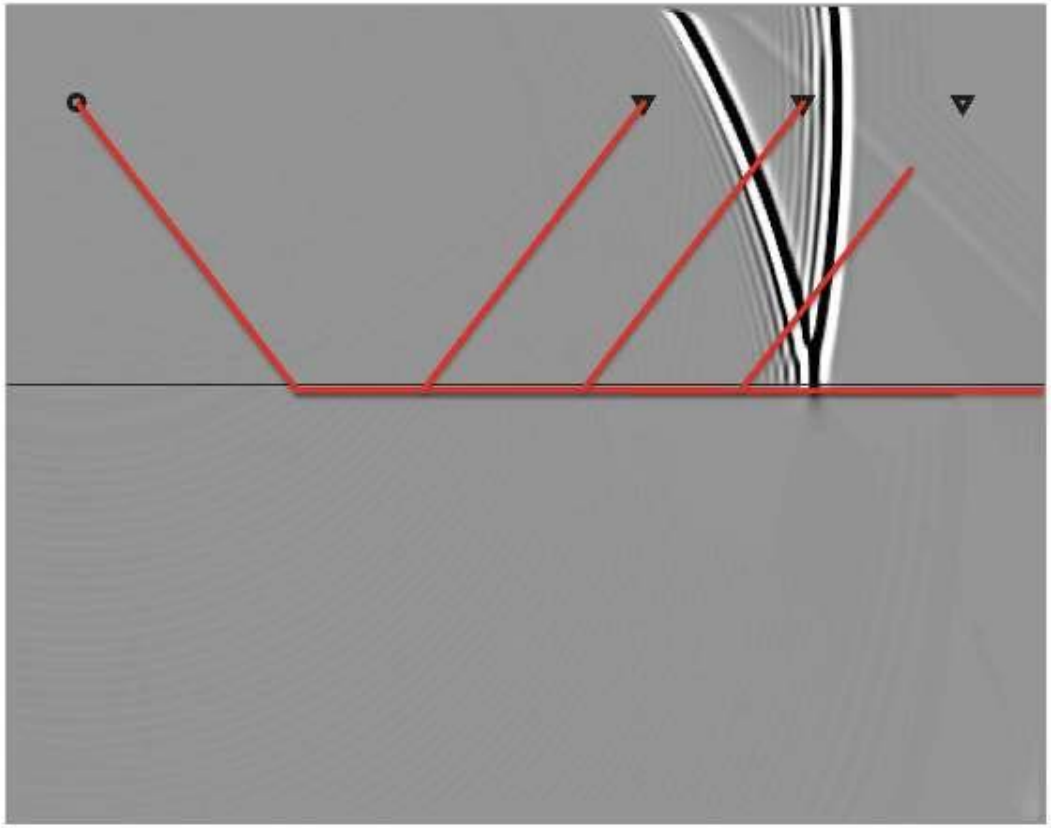


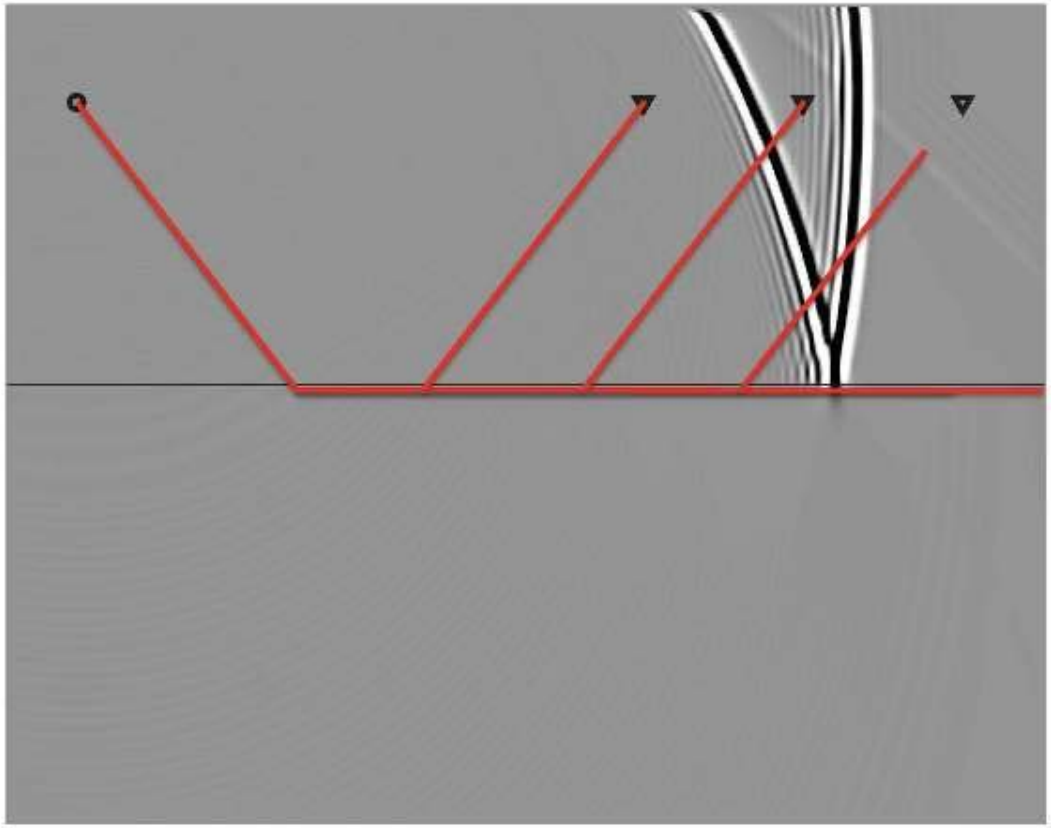


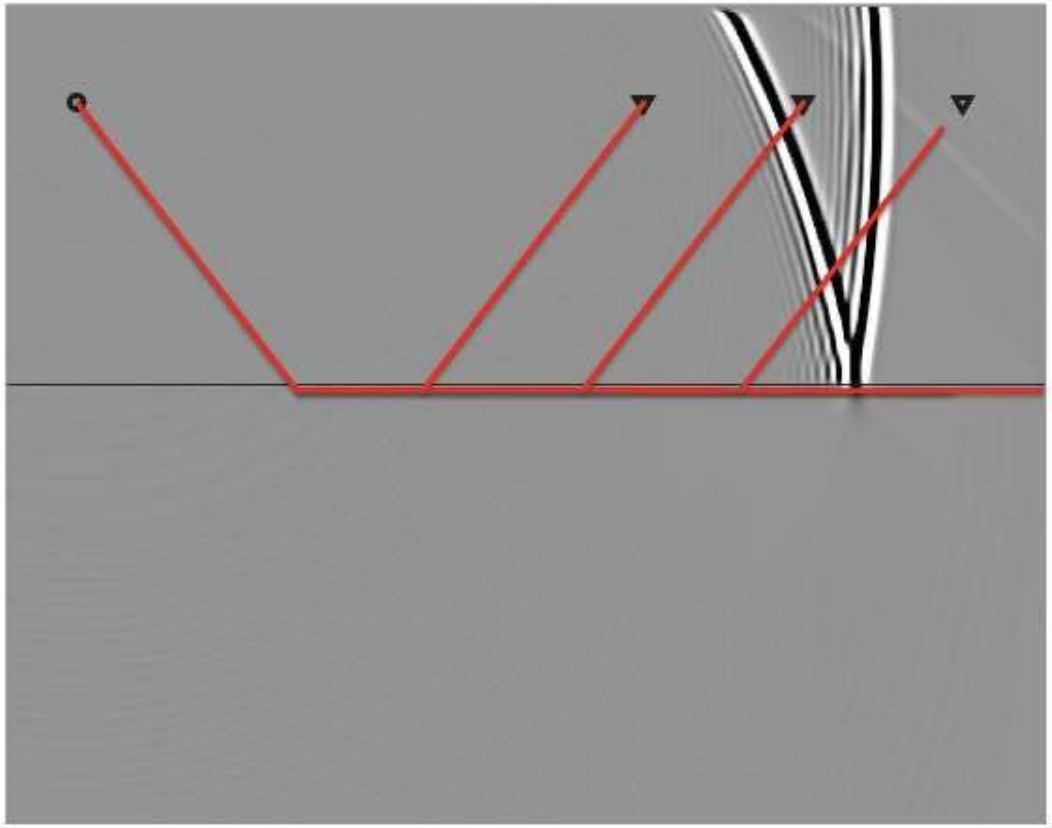


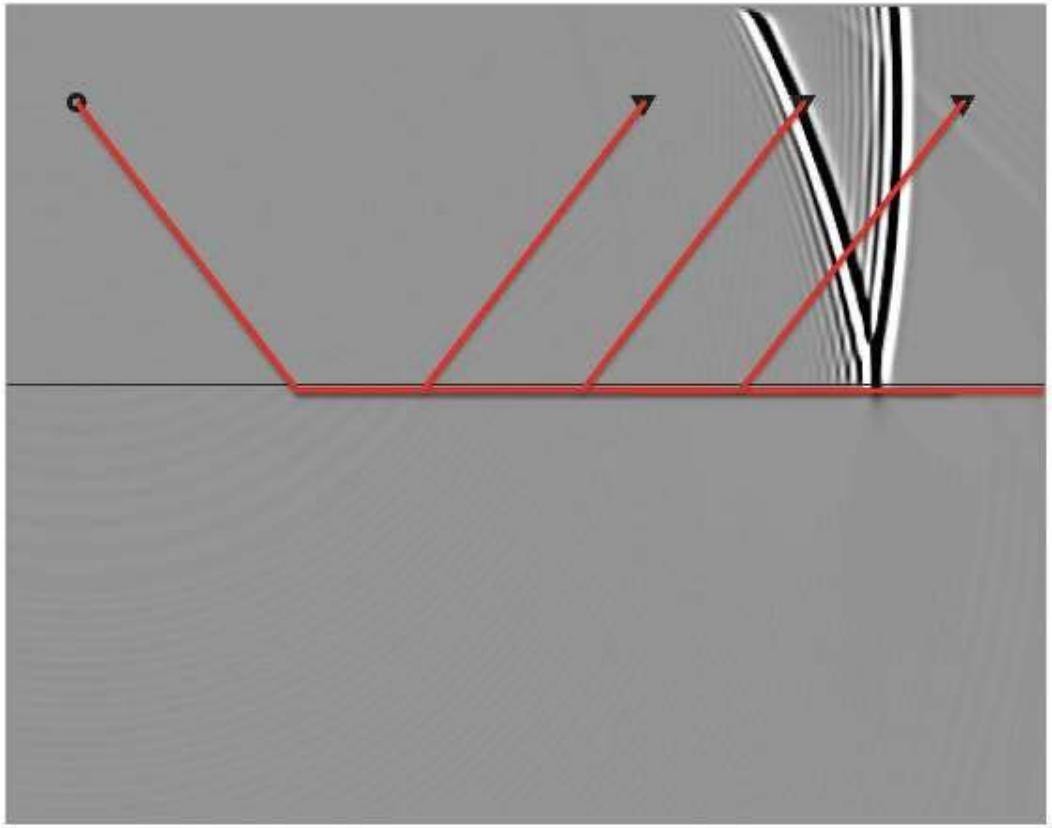






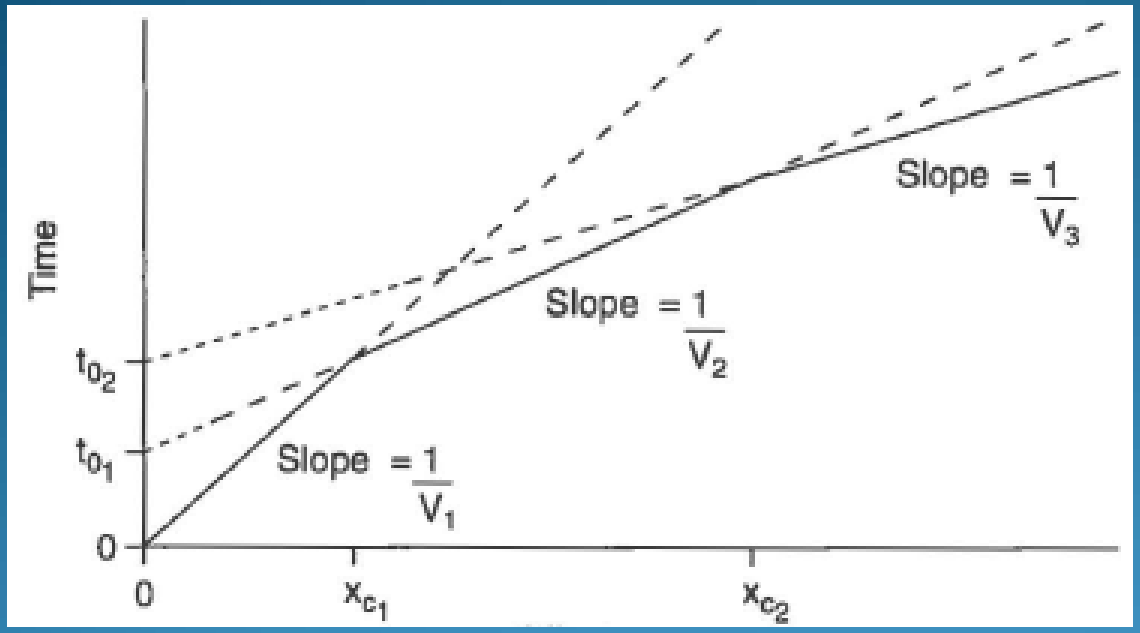




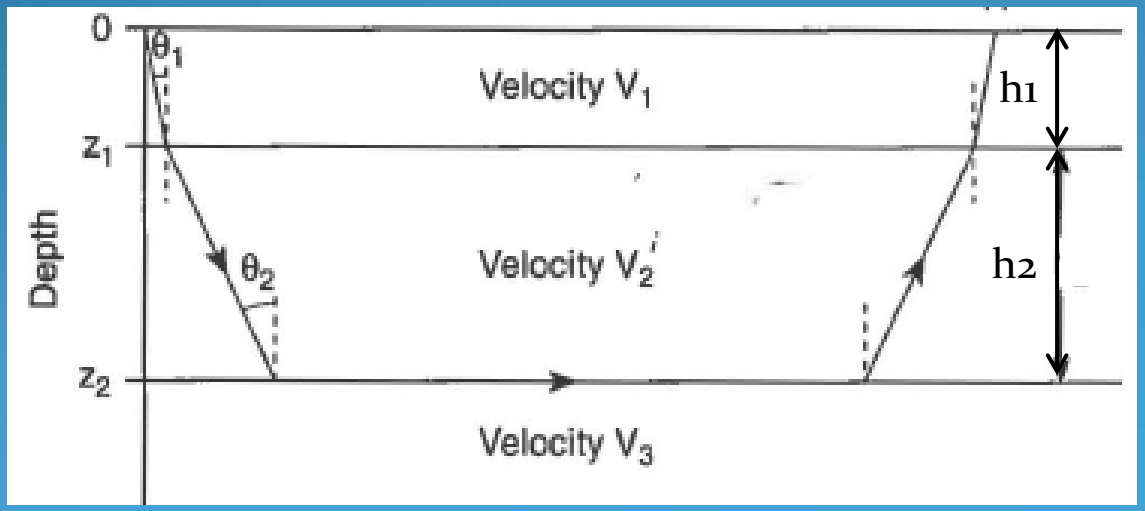


x

Calculations



$$h_1 = \frac{Xc}{2}\left(\frac{V_2 - V_1}{V_2 + V_1}\right)^{1/2}$$



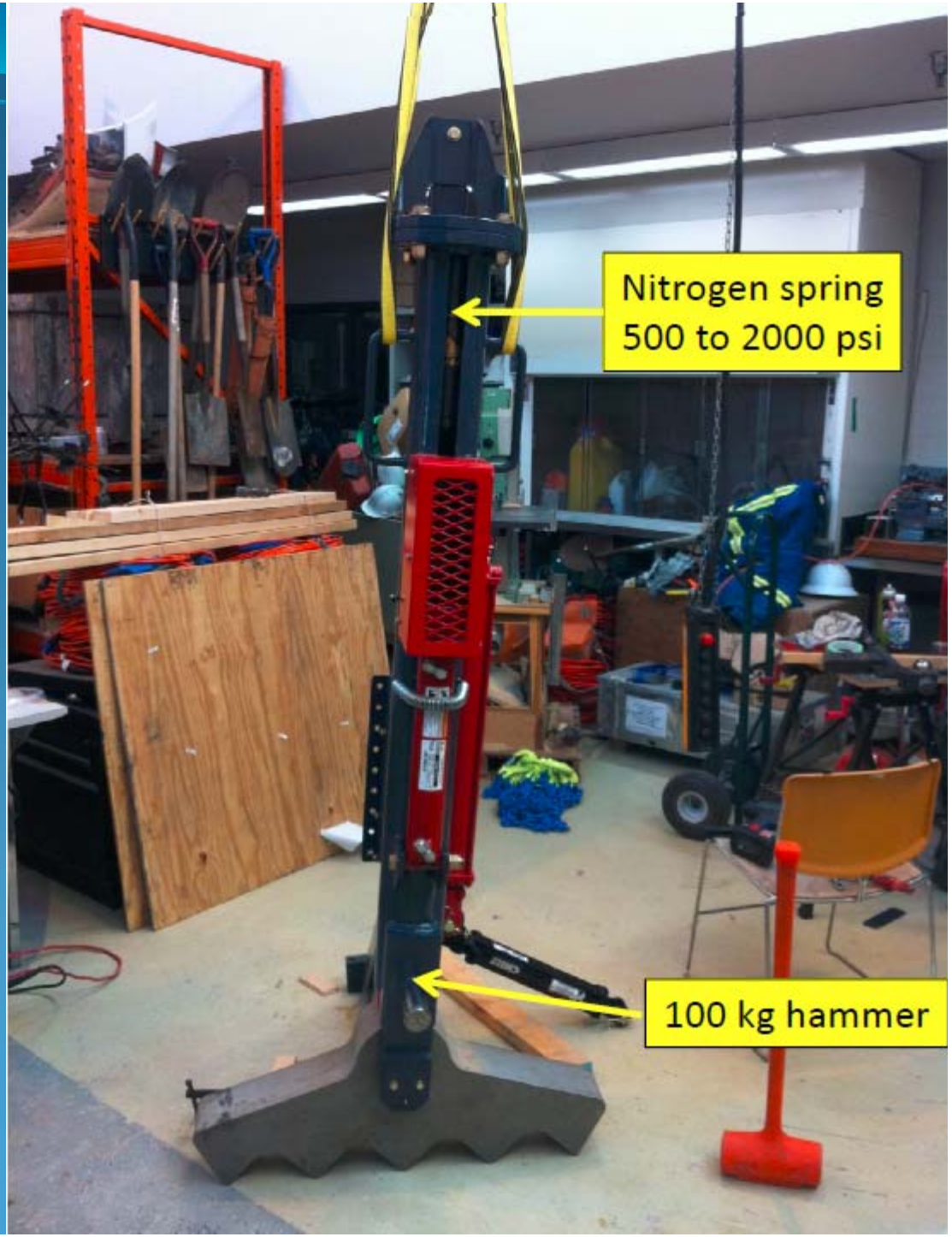
$$h_2 = \left(\frac{t_{02}}{2} - \frac{z_1 cos\theta_1}{V_1}\right)$$

(Cox, M. 1999)

Campus West Site

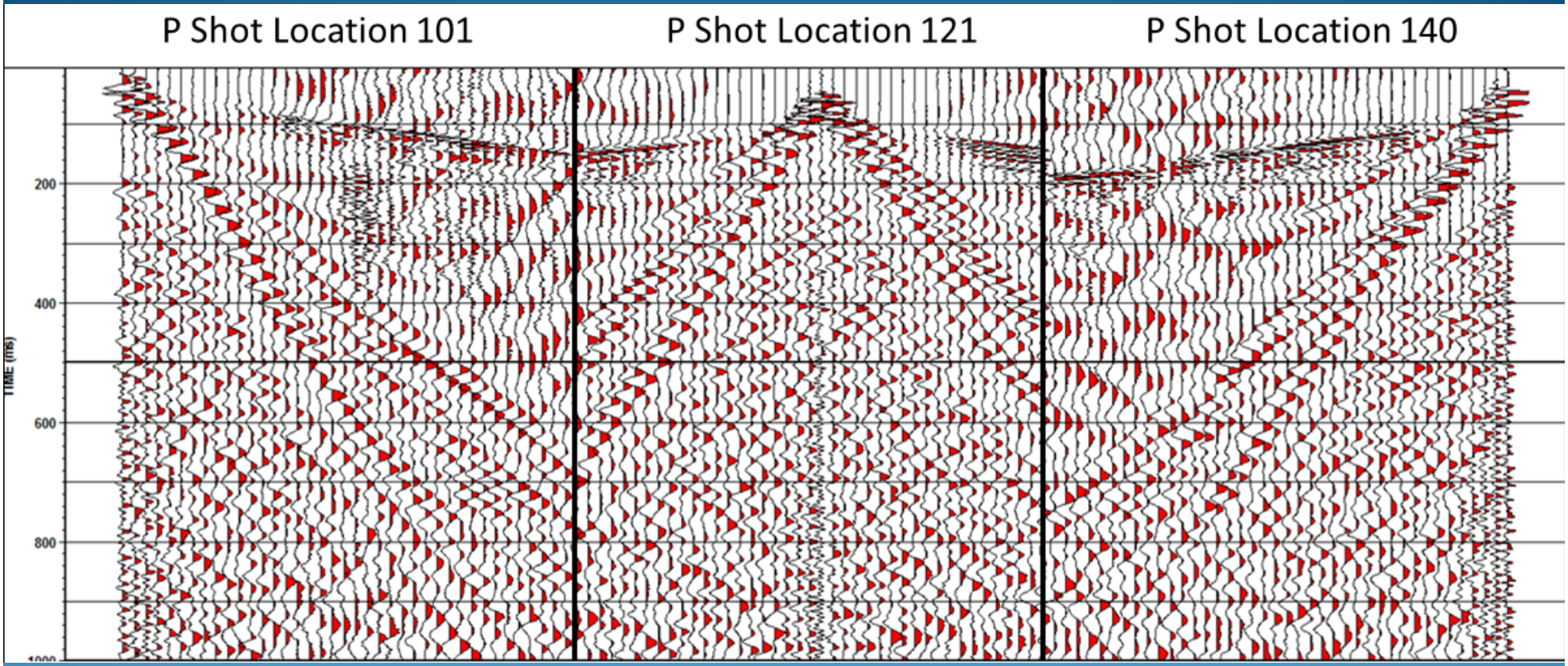
United Service Alliance Model A200

- Anvil style compressed nitrogen accelerated weight drop
- 18 cm piston travel
- 2000 kg trailer mount



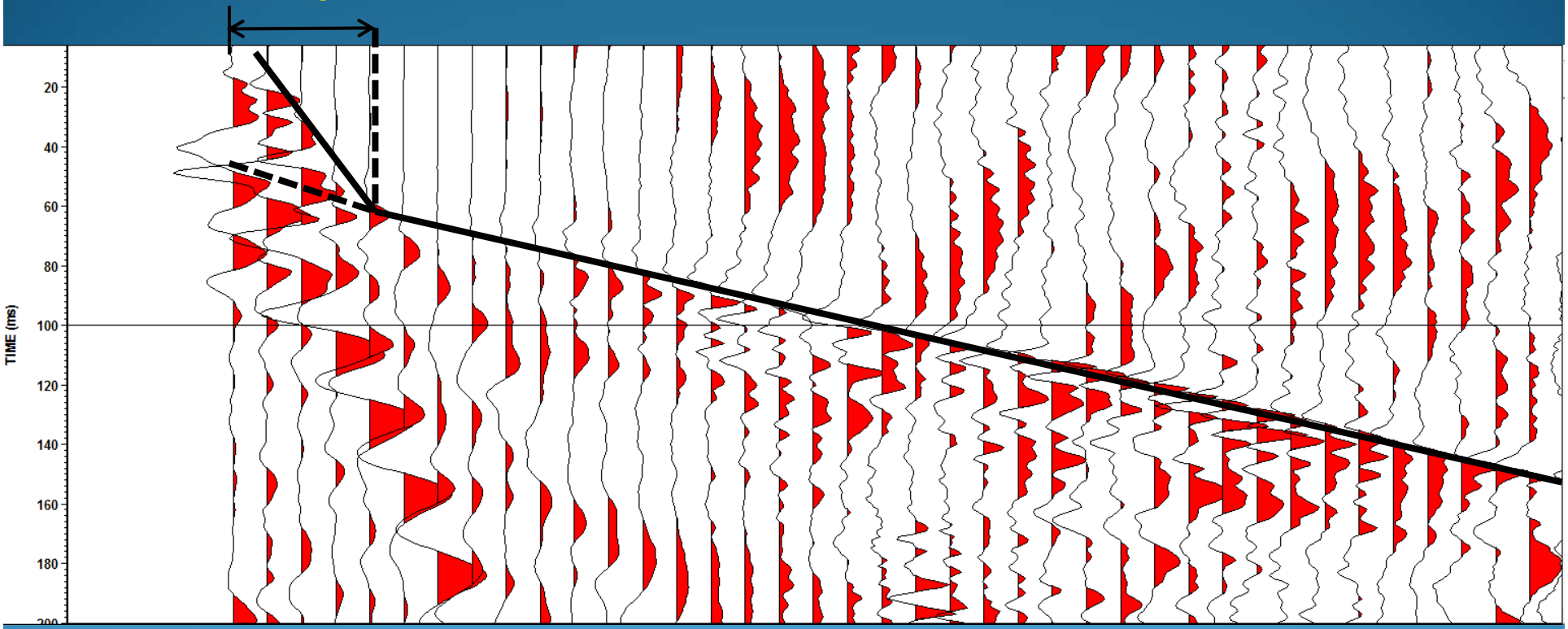

1202

Campus West Site



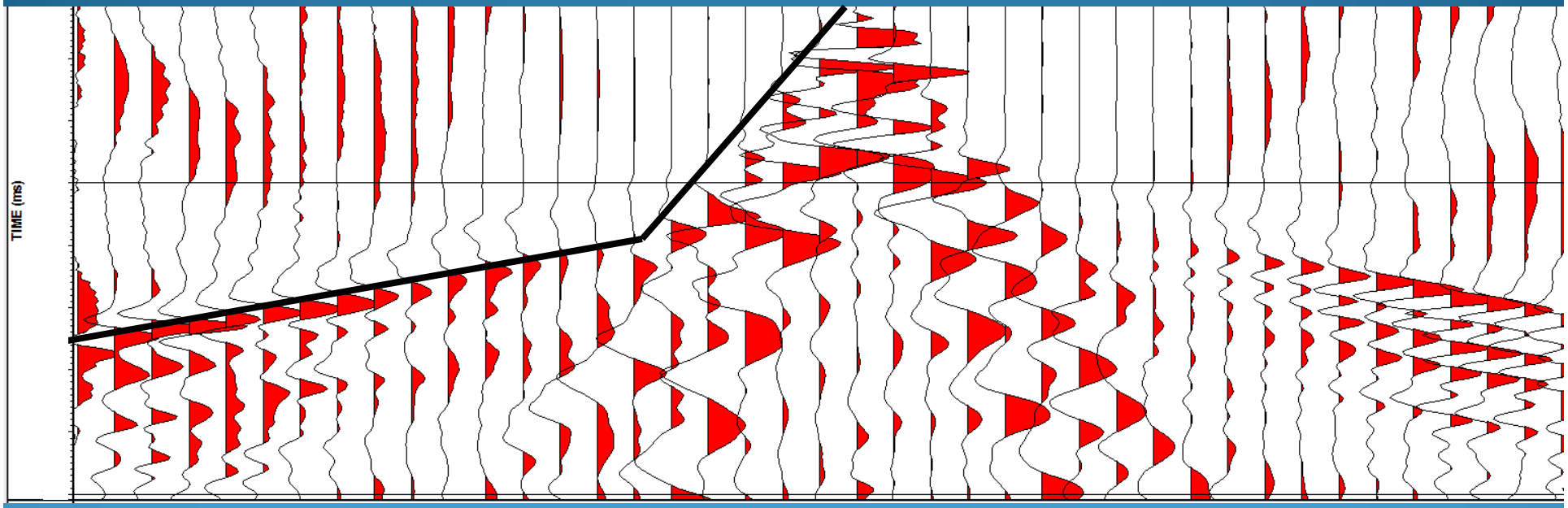
Campus West Site

P Shot Location



Campus West Site

P Shot Location



Campus West Site

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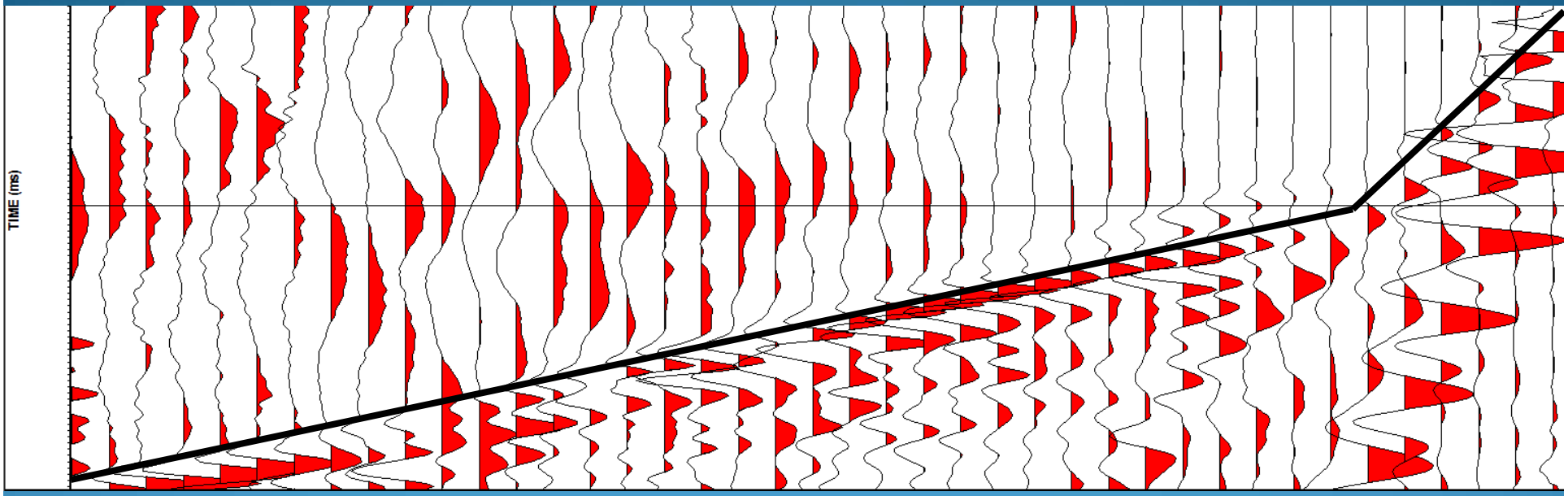
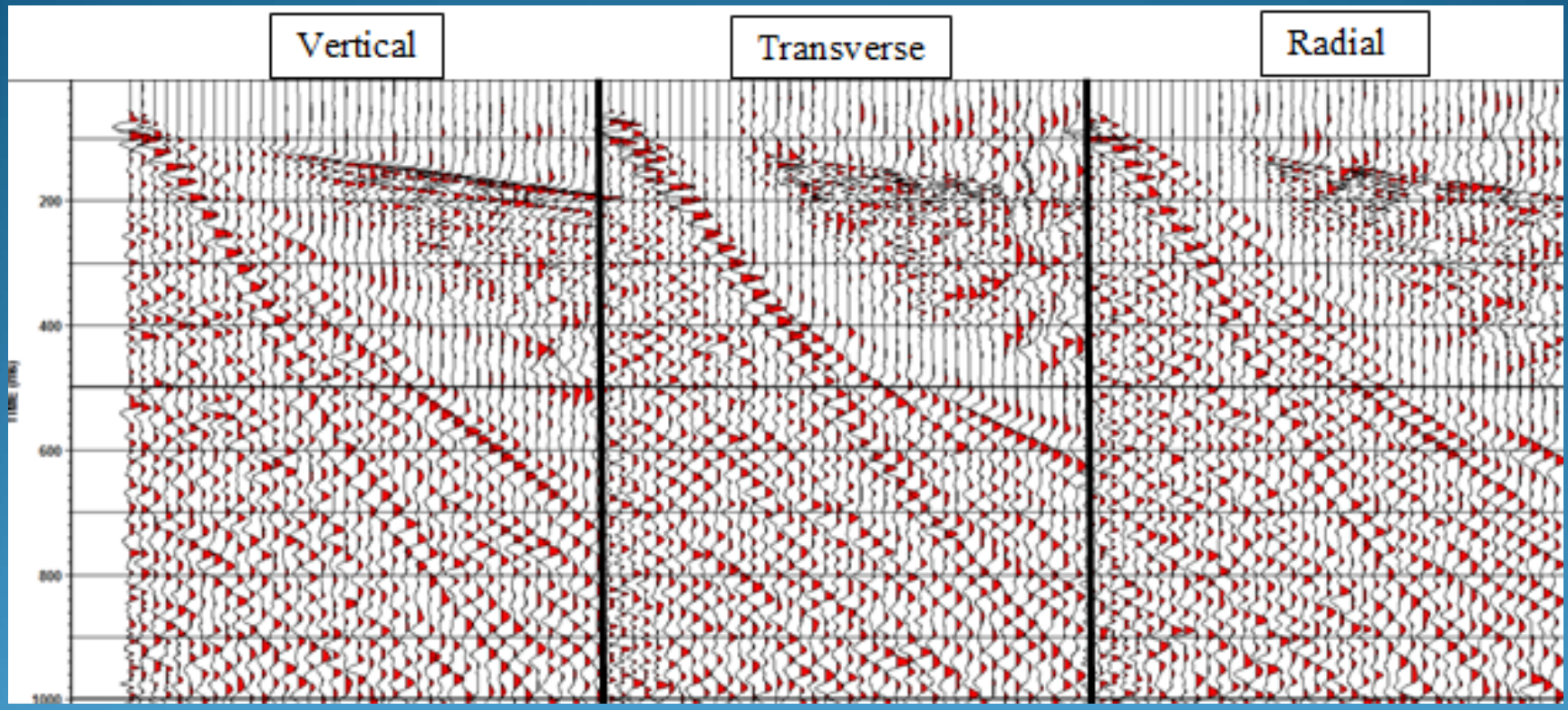


Campus West Site

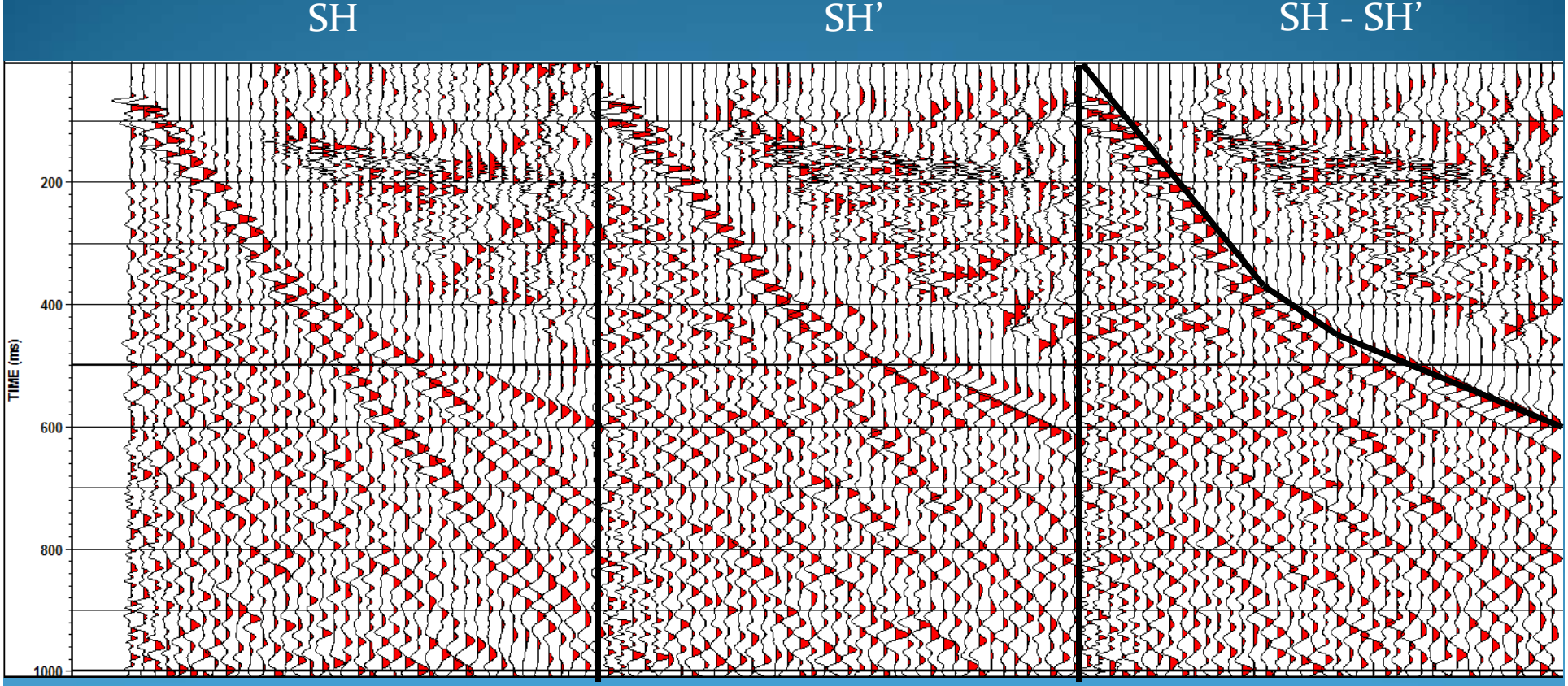
S Shot Location 101



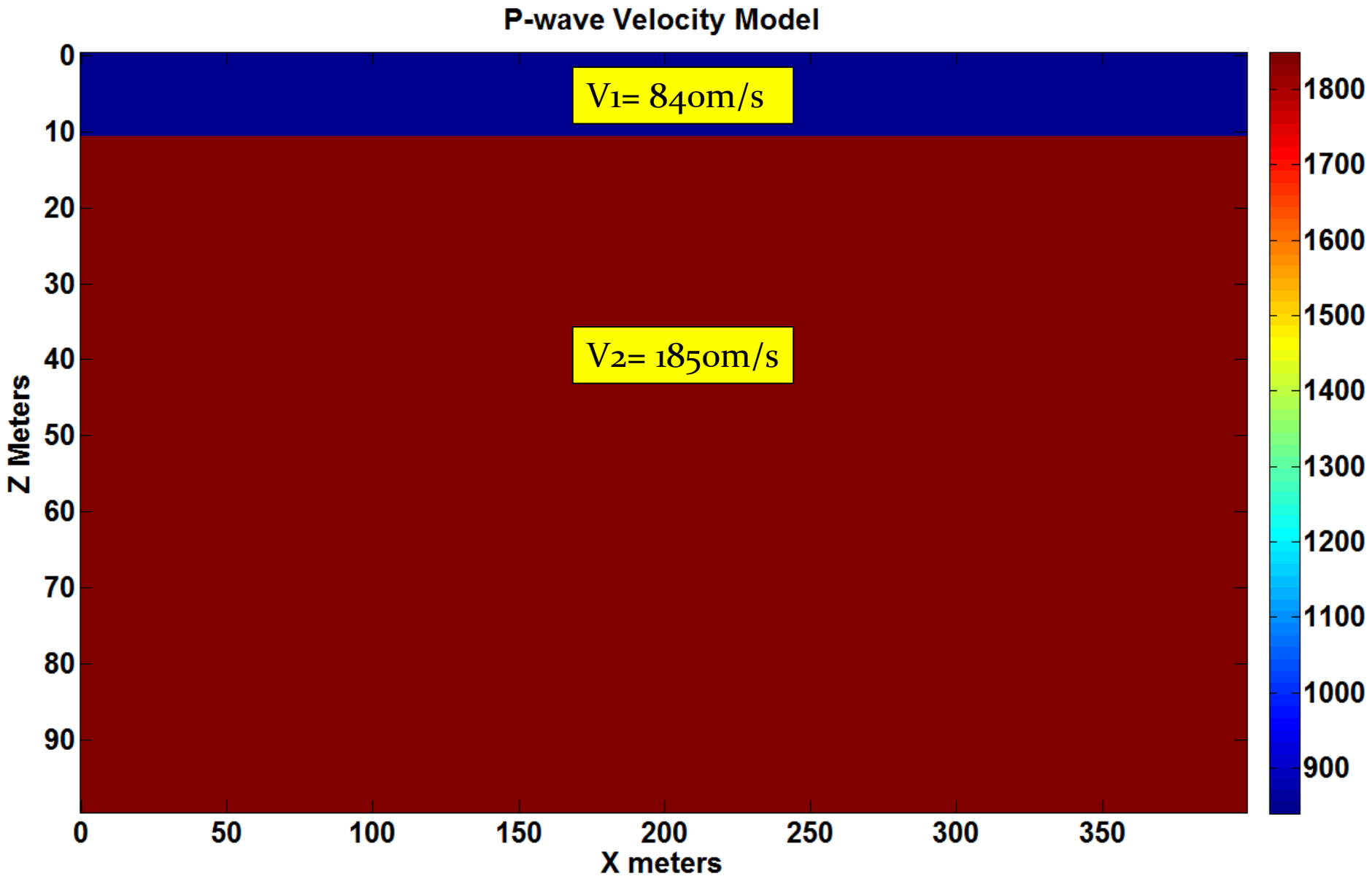
Transverse shot polarization

Campus West Site

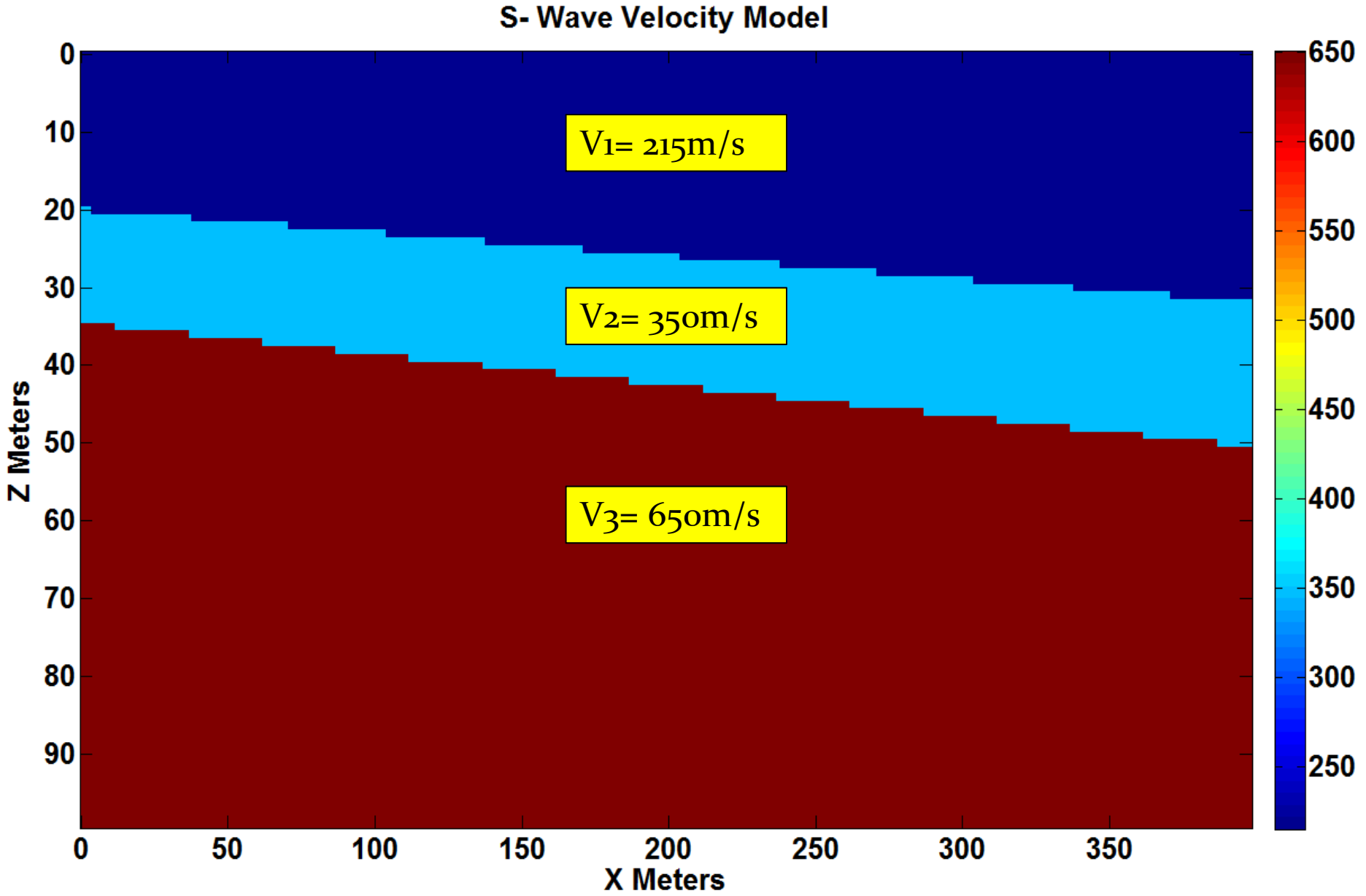
S Shot Location 101



Campus West Site



Campus West Site



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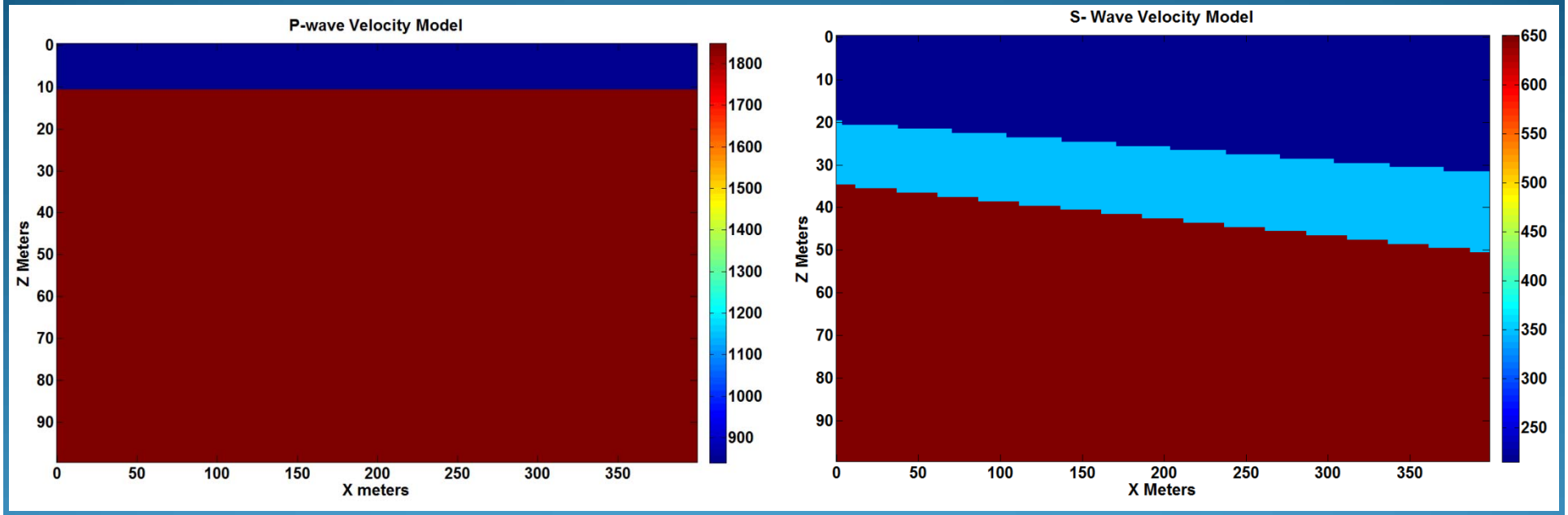
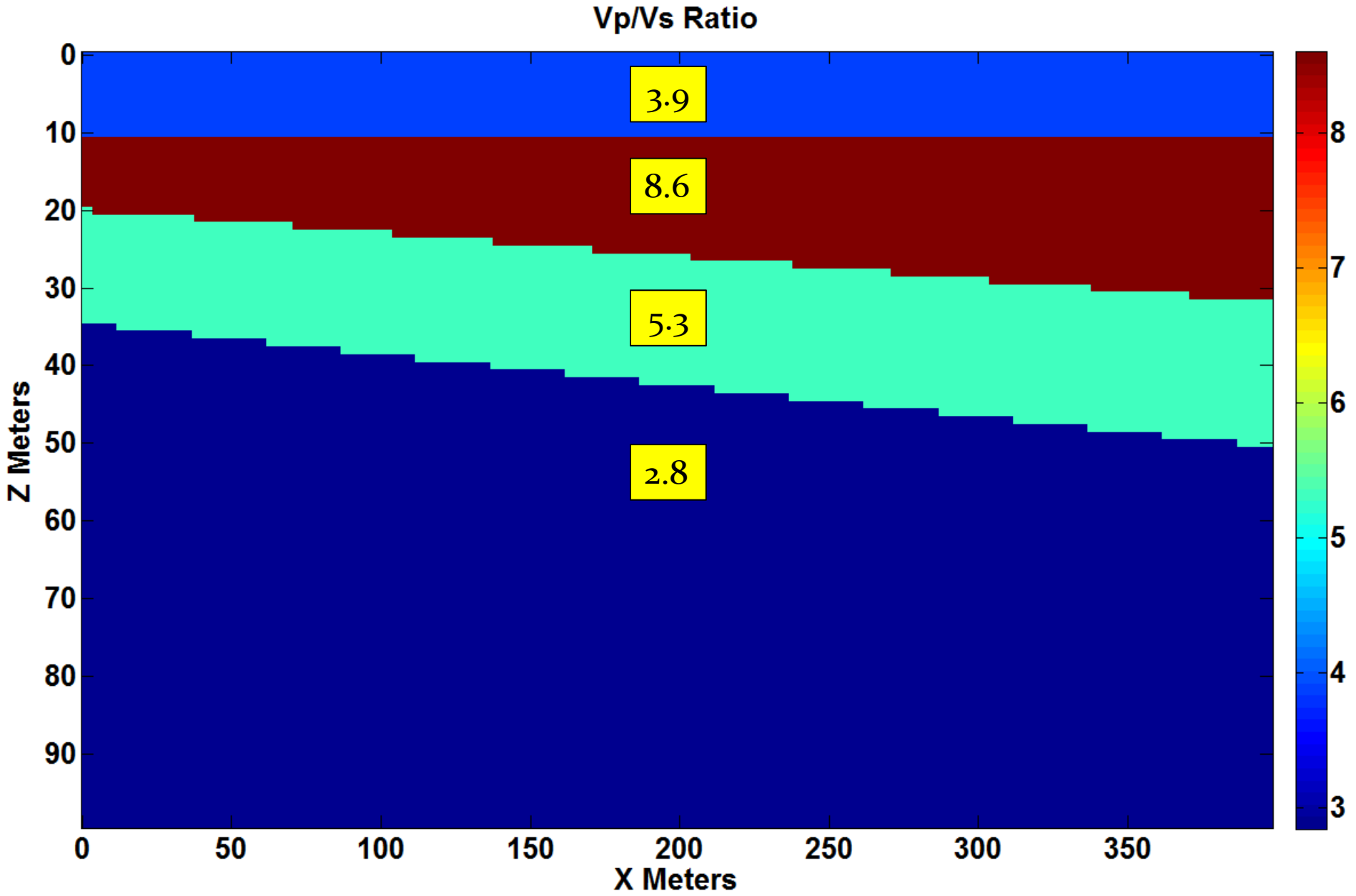
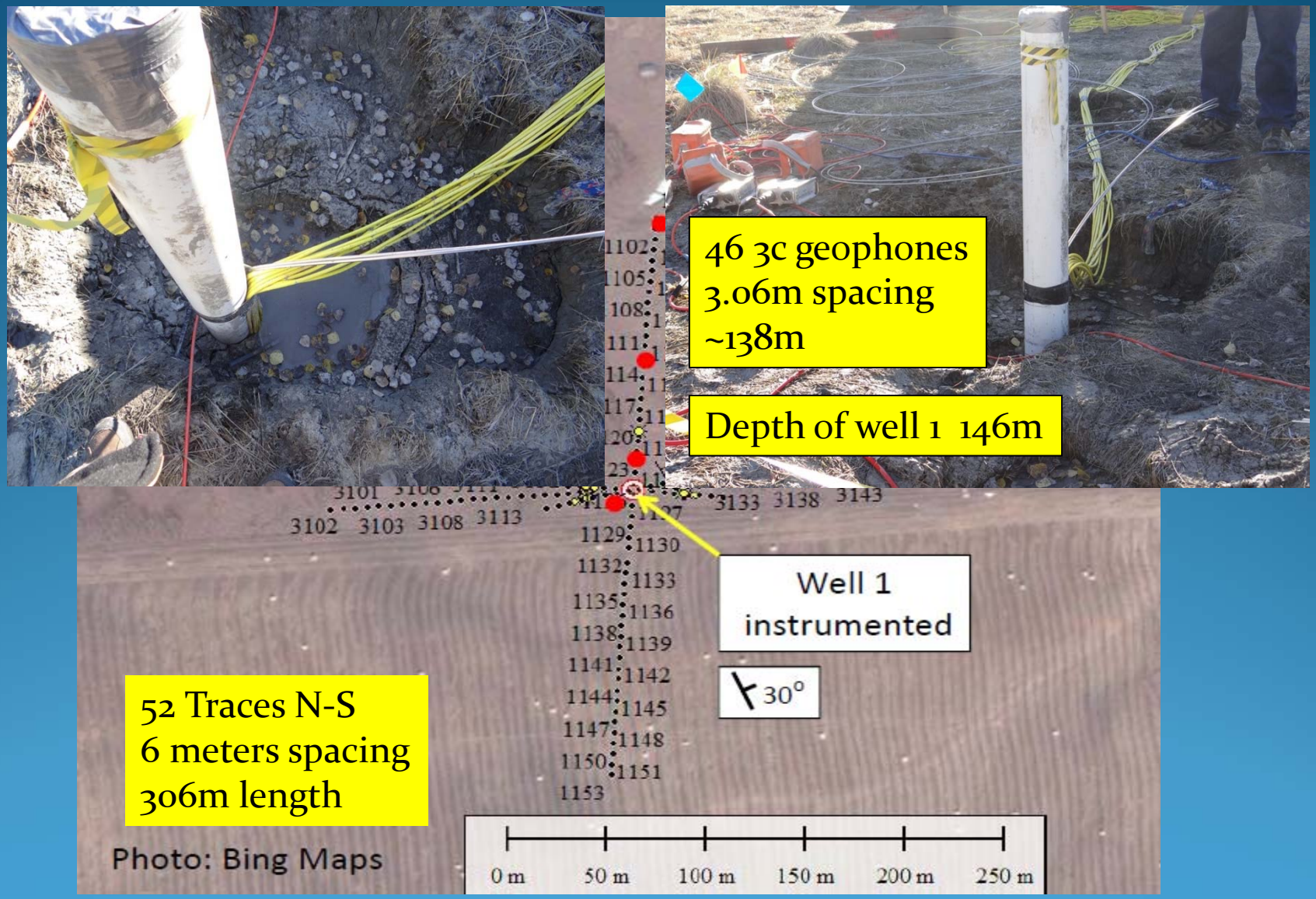


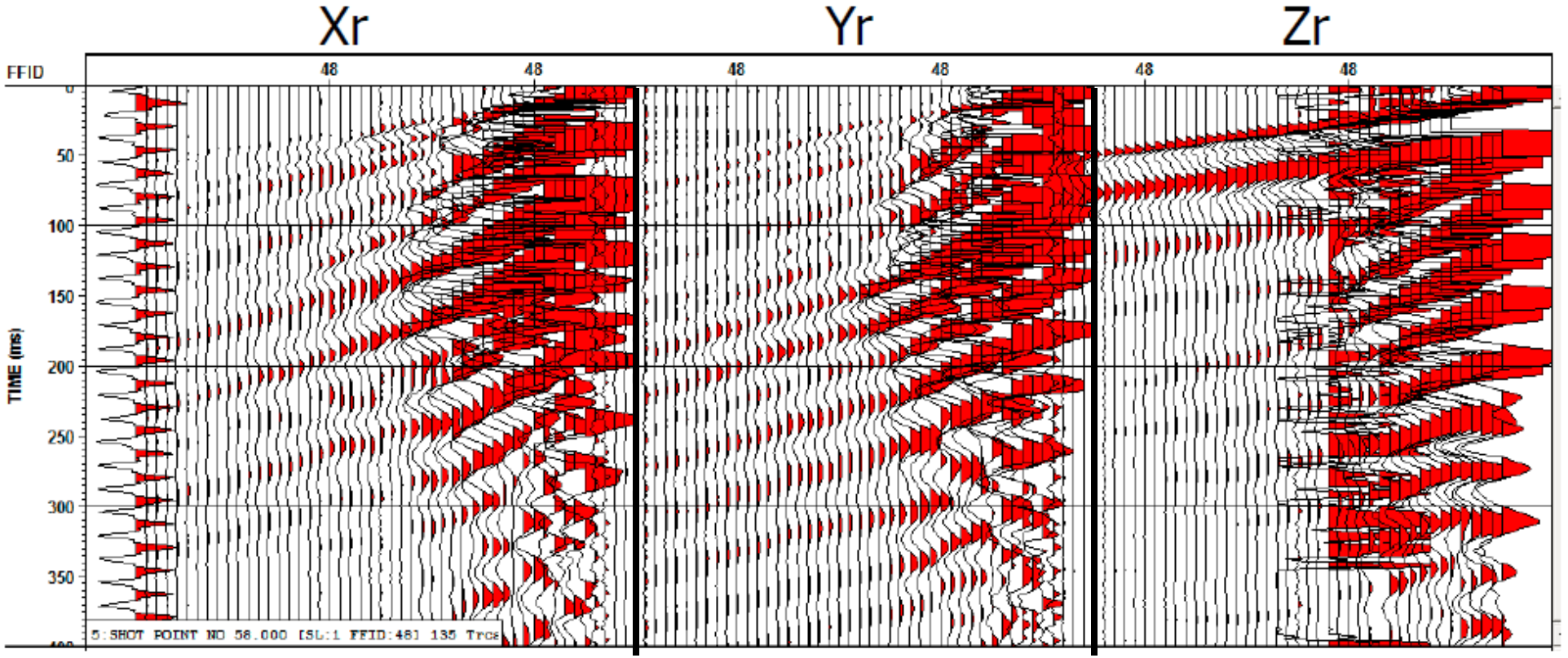
Campus West Site

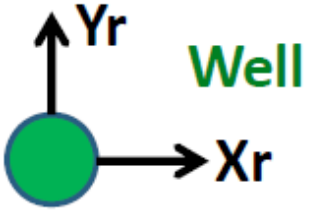


Survey Layout in Priddis



Zero Offset VSP at Priddis Well # 1





Well

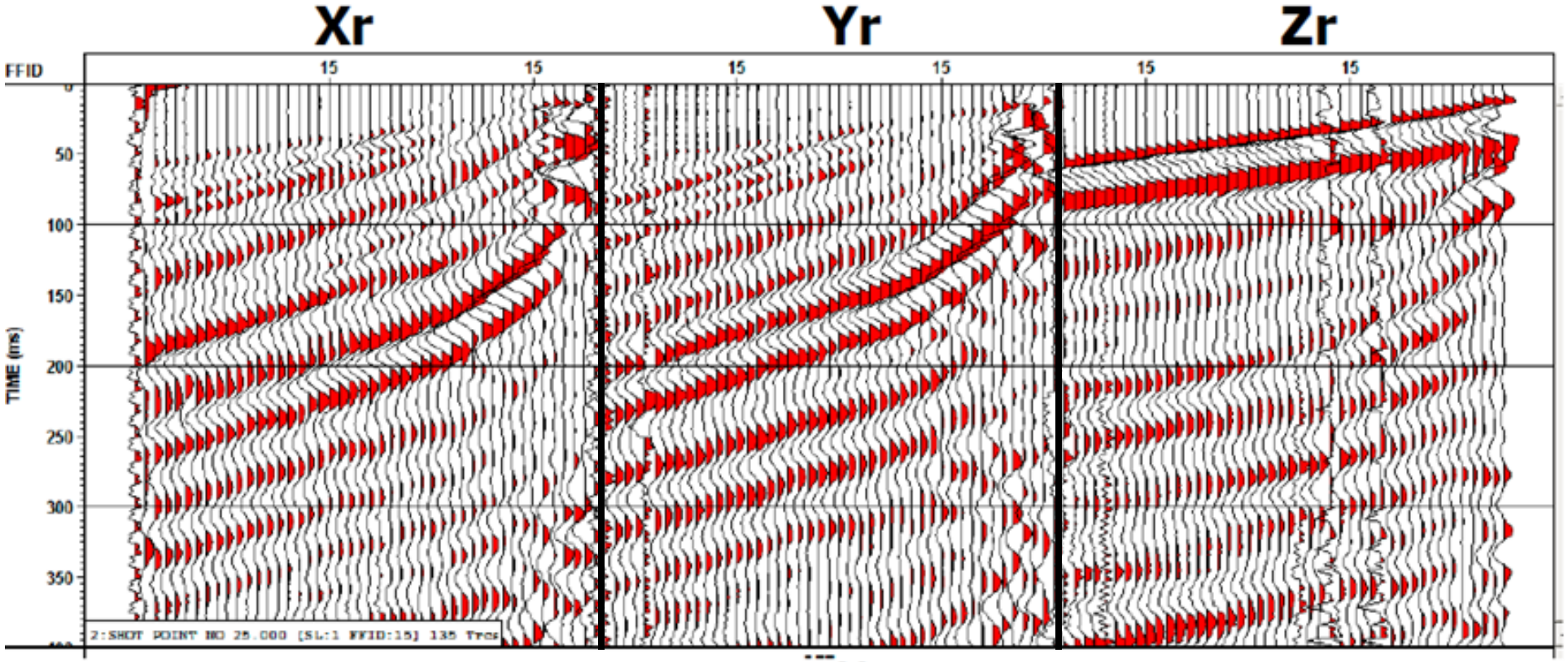
Offset dx = 2.5 m W

Offset dy = 3.7 m S

Source

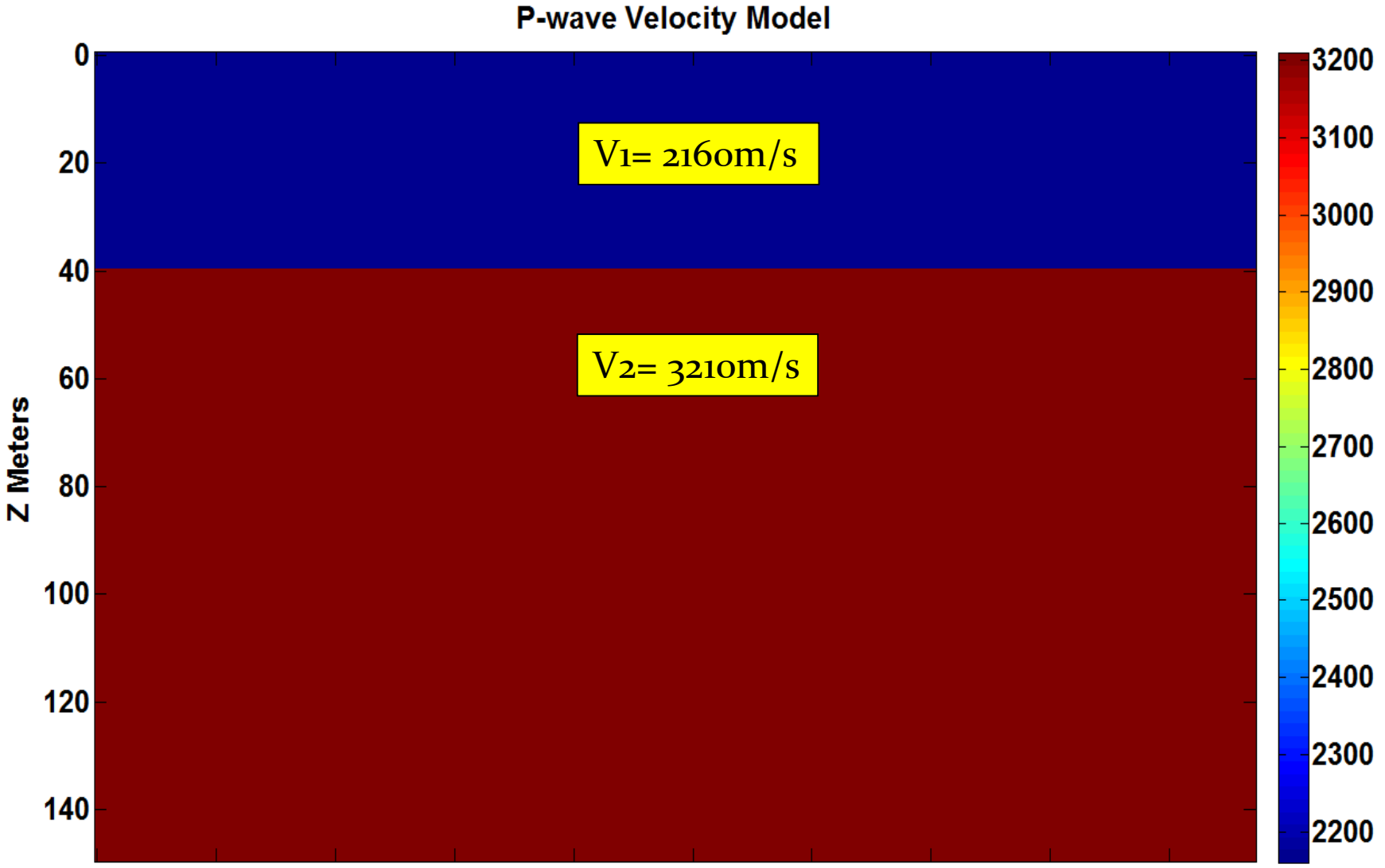
(Lawton, D. et al. 2013)

Zero Offset VSP at Priddis Well # 1

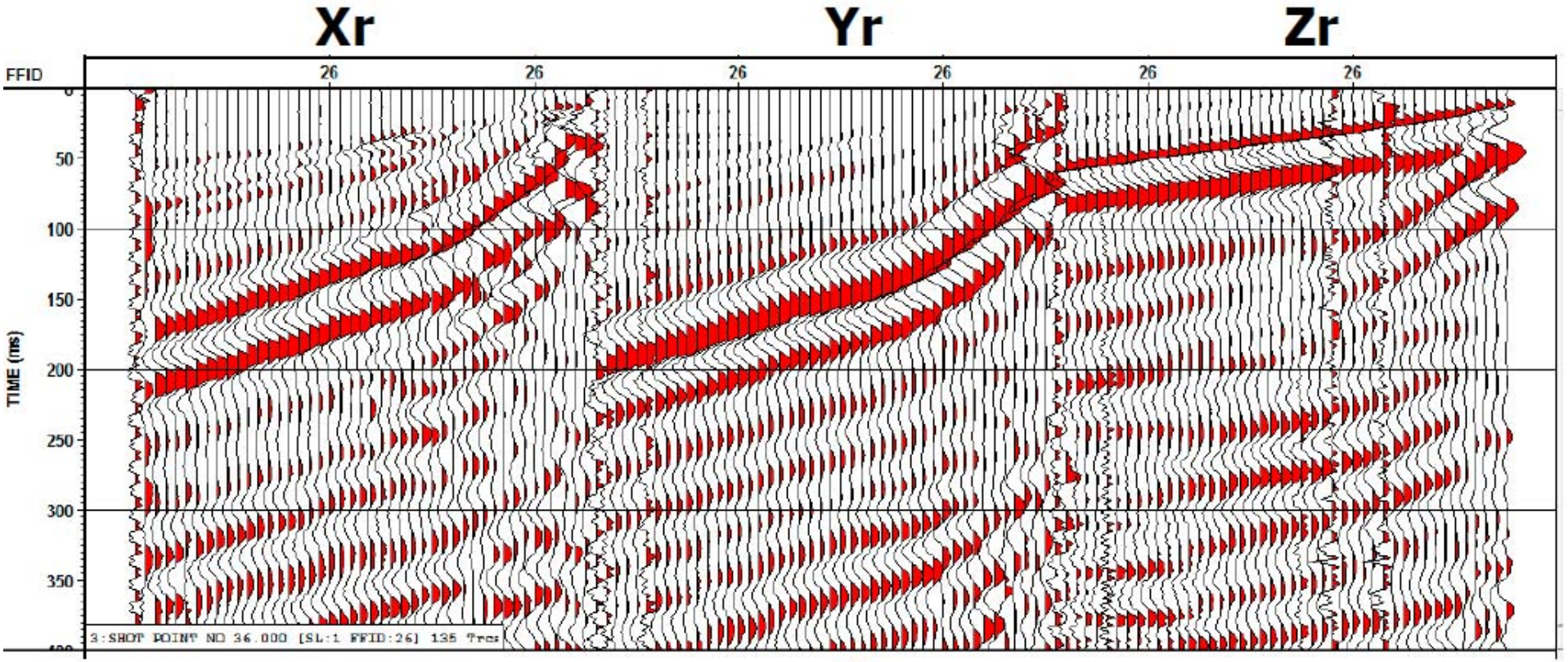


(Lawton, D. et al. 2013)

Zero Offset VSP Well # 1 Priddis

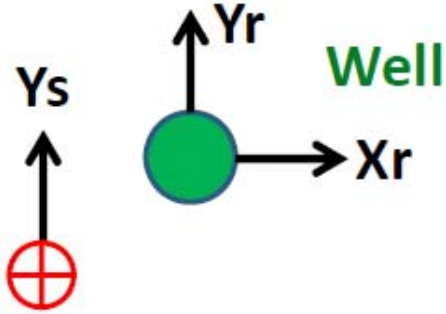


Zero Offset VSP Well # 1 Priddis



Offset dx = 2.5 m W

Offset dy = 3.7 m S



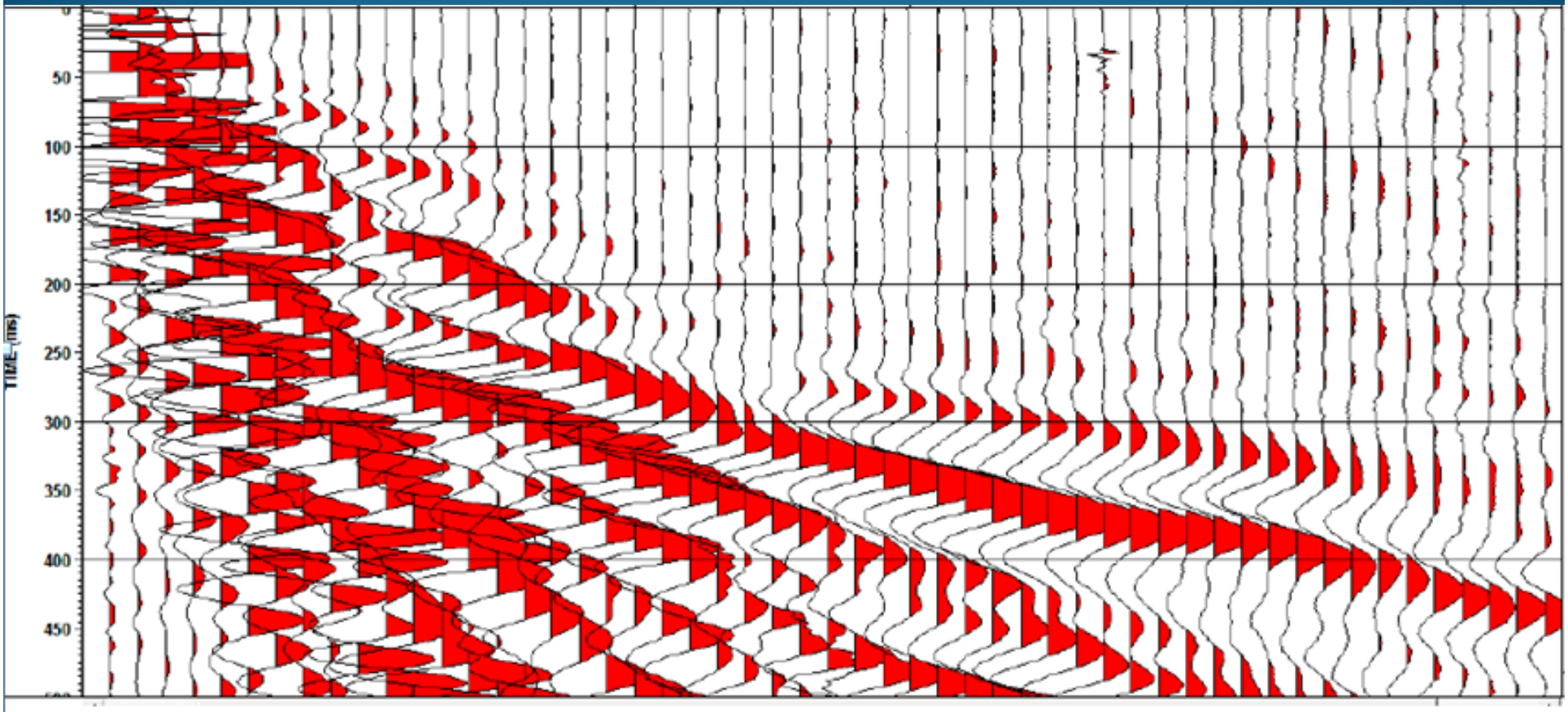
Vs1 = 520 m/s

Vs2 = 1400 m/s

Source

(Lawton, D. et al. 2013)

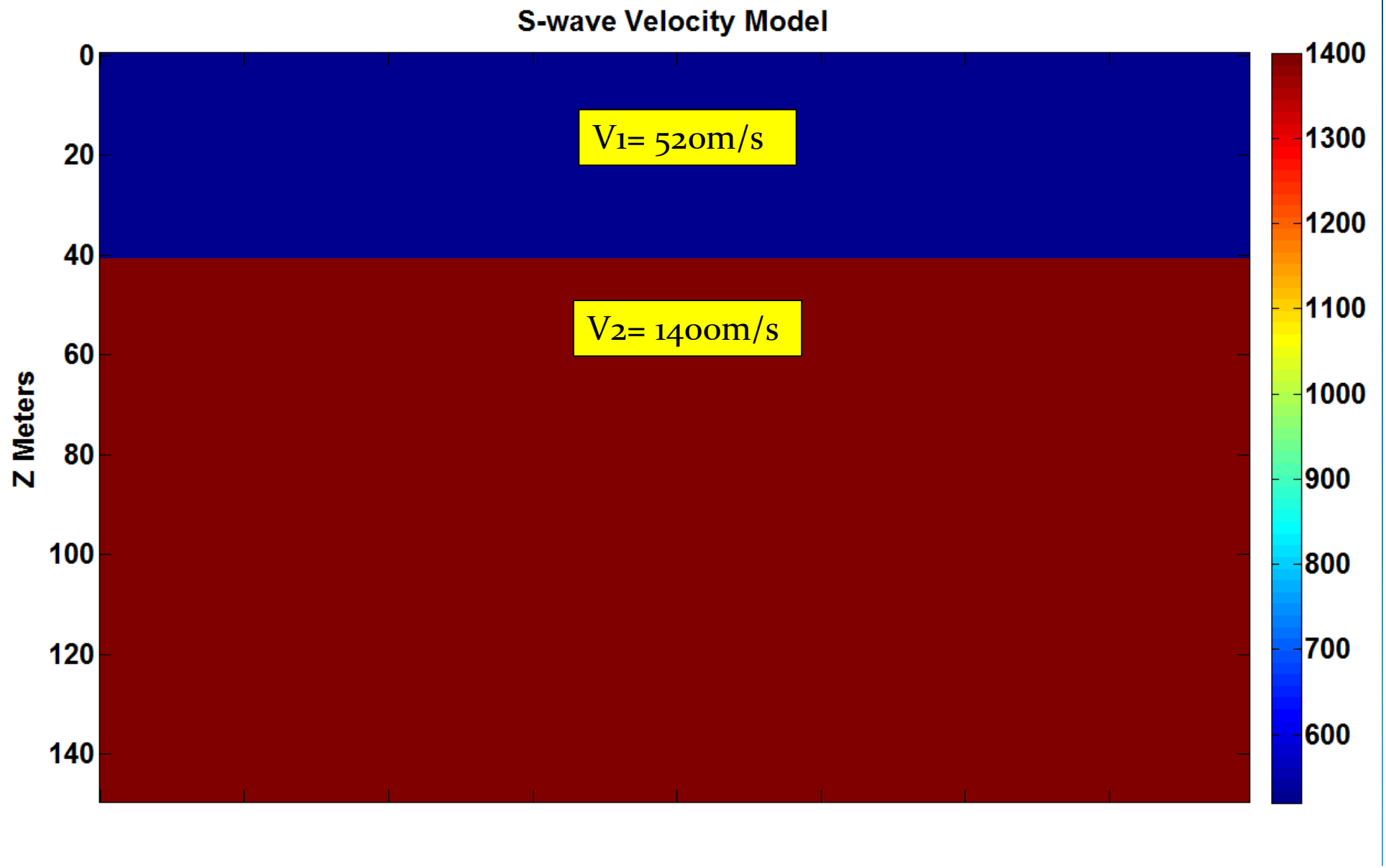
Surface Spread SH source Priddis



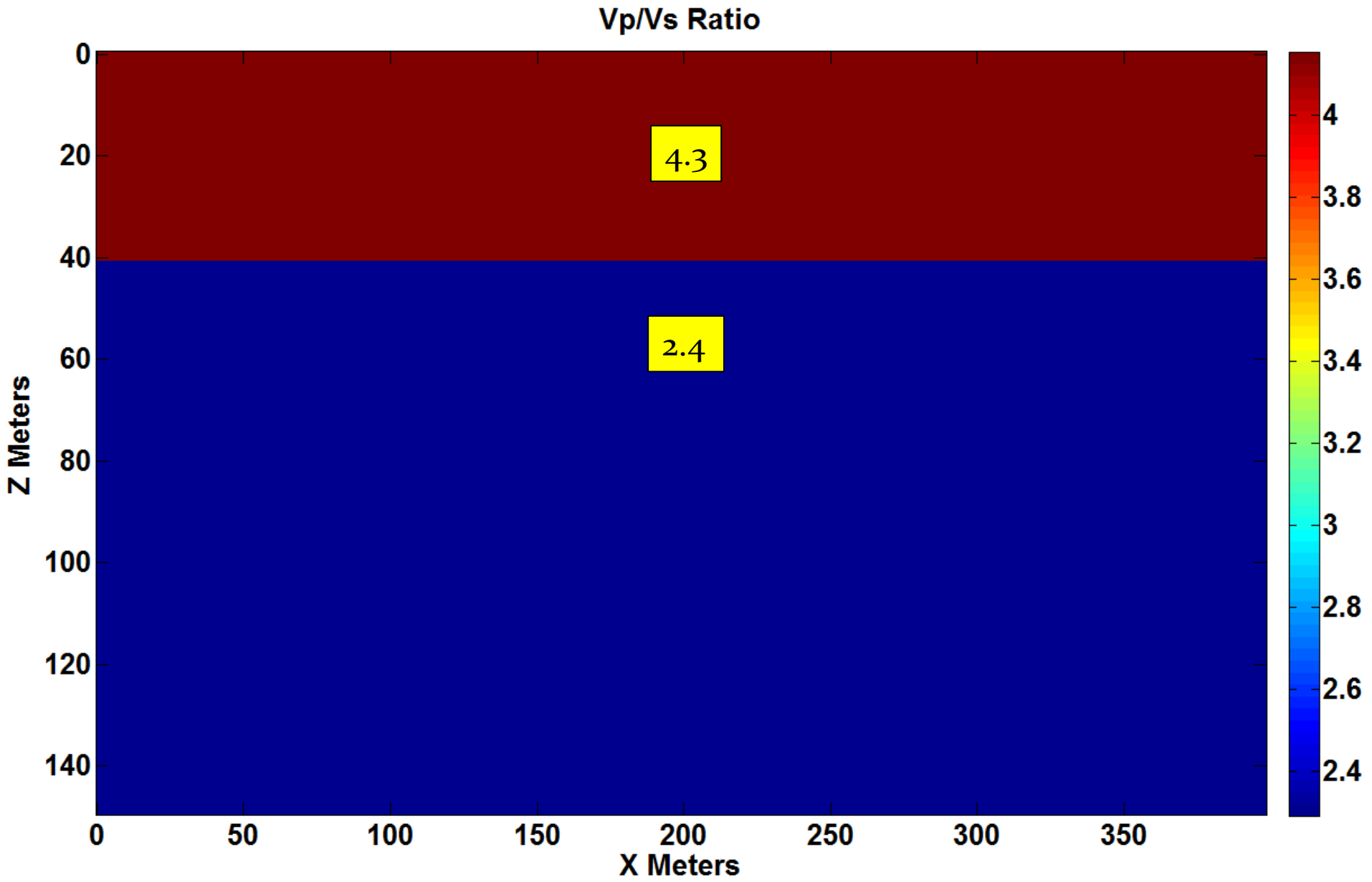
Vs2=1360m/s

(Lawton, D. et al. 2013)

Zero Offset VSP Priddis Well # 1



Zero Offset VSP Priddis Well # 1



Summary

- Vp/Vs Ratio 3.9 and 8.6 below 10m for campus.
- Vp/Vs Ratio 4.2 and 2.3 below 40m for Priddis.
- Source provided good energy for far offsets

Acknowledgements

- Supervisor Dr. Don Lawton.
- Malcolm B., Kevin B., Kevin H., Eric G.
- Crewes Staff , students and sponsors.
- Gedco for providing our Software.
- Carbon Management Canada.
- NSERC.

Thank You