King Fahd University of Petroleum & Minerals

Earth Sciences Department

Modelling of Refraction Velocity and Shear Wave in the KFUPM Beach

By Ali Oncel

Term Project for:
GEOP 402, Seniour Project

February 1, 2007

1. ABSTRACT

- *A brief summary of your project.*
- *Entices* the reader to want to read on; makes the reader curious about the details contained in the rest of your project.

2. INTRODUCTION/PROBLEM

- Introduces geography and tectonic setting of the region to the reader.
- Defines the objective of your project ("to understand the *refraction velocity changes and their linkage to the subsurface geology….*").
- Summarizes how you went about achieving your objective ("research constrains on the region offered by *geophysical observations*"
- States specific geophysical studies reported on in the literature.
- Offers *conclusions*, perhaps in the form of general models (or competing models), that can be developed from those studies.

3. EXPERIMENTAL DESIGN

For a field study this section should include an index map showing where you collected data, what equipment you used, references (e.g. standard textbook) to standard techniques if that is what you employed. Include a comment on why this experimental design is the appropriate one for the objective.

- Write clearly what your layout model is? See an example of used layout model for refraction survey.

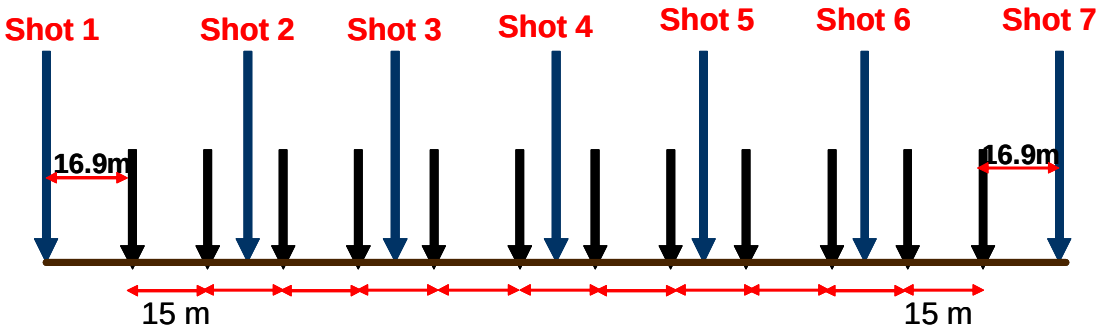

Figure 1: An example of used layout model Field-Trip in KFUPM Beach. In this model, fixed geophones and move shot points. Then, use data based upon multi-shoots for model of refraction tomography, from the field-trip report of Oncel, 2006.

4. RESULTS: OBSERVATIONS

4.1. ***Field-Measured Velocities:*** Give specific observations for each type of geophysical data and show one of your field-measured data in plot. For example, an example of picking P-wave velocity is

given in below. That is compiled from the Field Trip which is made under the class of Geop-202 in 2005.

Dis	PICKS (m/s)	
m	Obs	Cal
Forward		
0	18.70	17.56
30	47.60	46.27
45	43.60	46.30
60	51.60	51.25
75	57.20	56.97
90	65.30	63.57
105	70.90	70.56
120	75.70	75.94
135	80.50	79.48
150	80.50	80.93
165	81.30	82.91

Dis	PICKS (m/s)	
m	Obs	Cal
Reverse		
165	17.20	14.38
135	34.00	33.88
120	38.80	40.27
105	45.20	44.99
90	50.80	49.38
75	52.40	53.69
60	57.20	58.65
45	64.50	63.22
30	71.70	70.69
15	78.10	80.63
0	80.10	80.60

Table 1. Field-measured velocity has been shown in above Table for two opposite shots, from the field-trip report of Oncel, 2006).

4.1. ***Plots of Field-Measured Velocities:*** Summarize the constrains on estimating number of surfaced layers with their velocities.

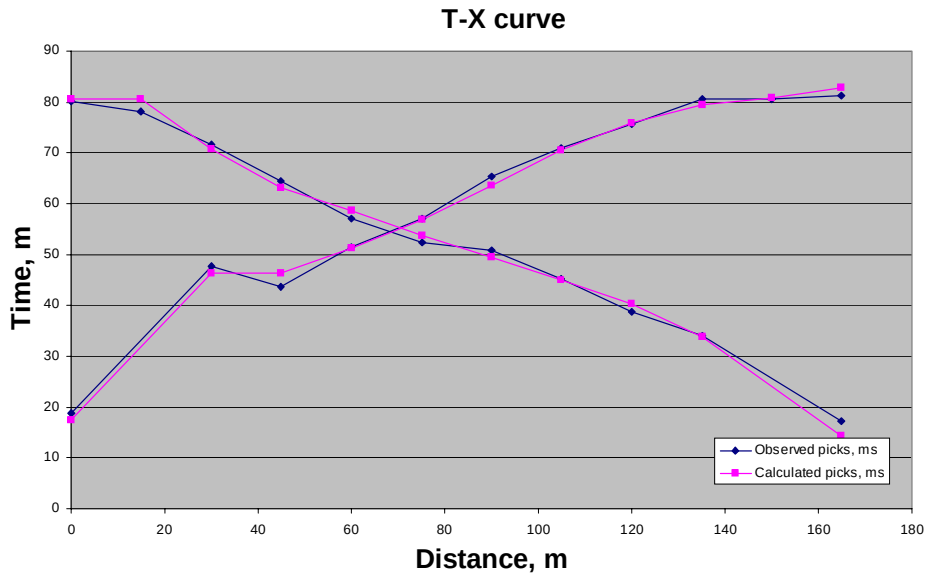

Figure 2: Plots of Field-measured velocity which is tabulated in Table for shots 1 and 7, from the field-trip report of Oncel, 2006).

5. INTERPRETATION AND CONCLUSIONS

5.1. ***Shear-Wave Velocity Modeling:***

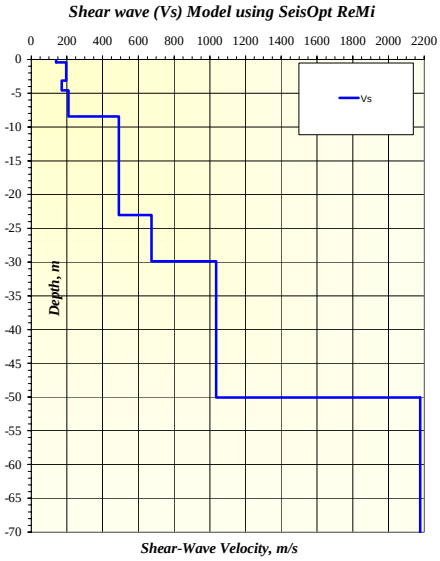

Figure 3: Shear velocity variation has been shown in depth (Figure from the field report of Oncel, 2006).

- *Write clearly how field-measured data in travel-time (or reflection) has been translated to the velocity. The results shown in Figure 3 are based on hand-based calculation or software-based calculation.*
- *What is your conclusion and interpretation from what appeared velocities in refraction profile of your region.*
- *How could you linkage the velocity to the geology? What is your geological model which might be?*

5.2. ***Refraction Velocity Modeling:***

- *What is your modeling work based on the refraction profiles?*
- *Indicate the way used to conduct the velocity model?*
- *What is the geological model likw, which might cause variation in the velocity?*
- *Clearly make your conclusion and possibly try to propose your speculation?*

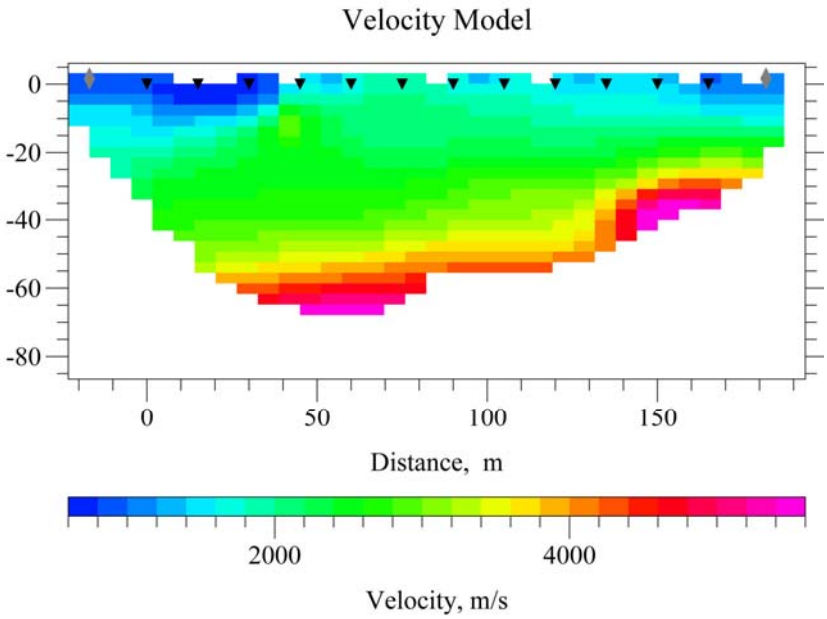

Figure 4: Velocity-tomography based on the layout model in Figure 1 (Figure from the field report of Oncel, 2006).

REFERENCES CITED

1. **SeisOpt @2D software.**
2. **SeisOpt ReMi**
3. http://faculty.kfupm.edu.sa/ES/oncel/FieldTripGeop202.pdf