

Practical 1. AVA Scenarios

Focus

This practical introduces a) some of the more commonly occurring amplitude versus angle responses and b) the use of the single interface AVA plot to predict the first order seismic response.

A) For each of the scenarios below use RokDoc-AVO (Essential level) to derive the AVA plot for

a) top reservoir (brine and hydrocarbon filled) (assume that lithology 1 is the upper lithology)

b) hydrocarbon contact responses (OWC GWC)

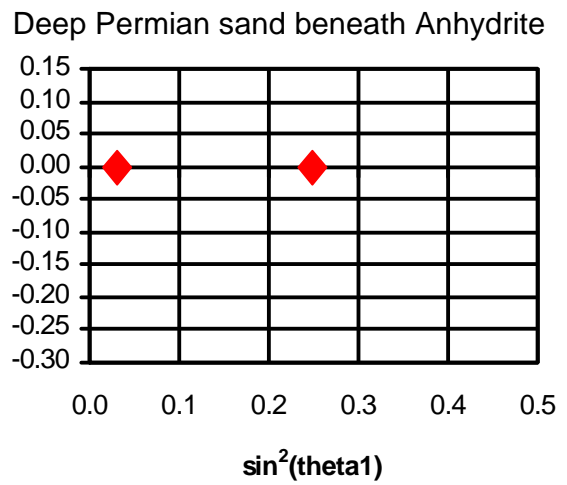
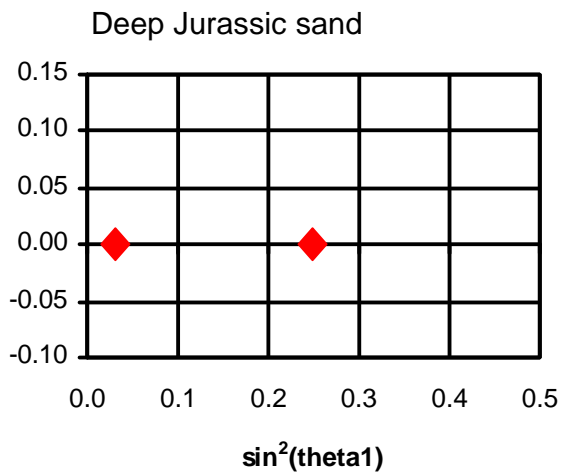
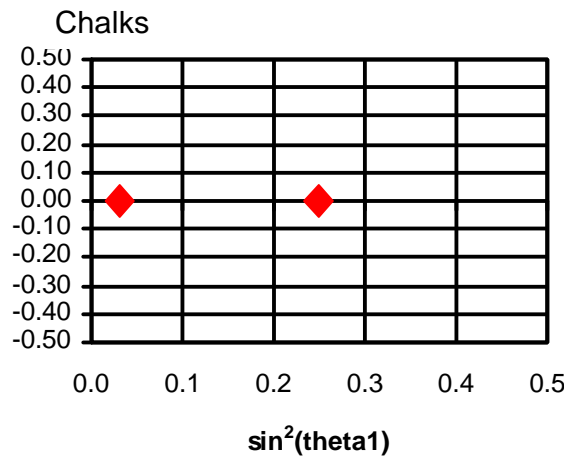
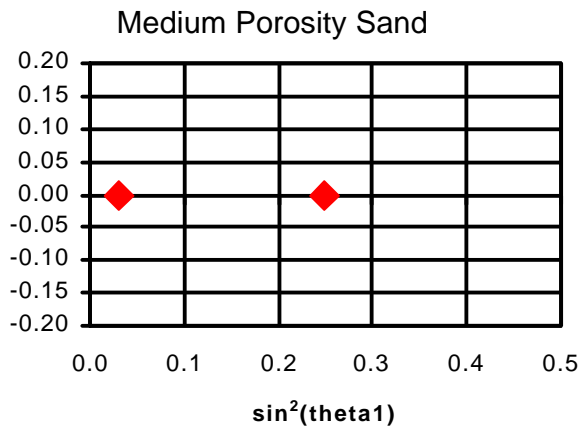
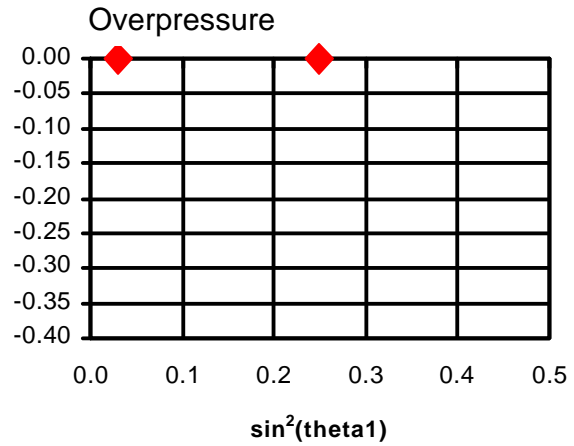
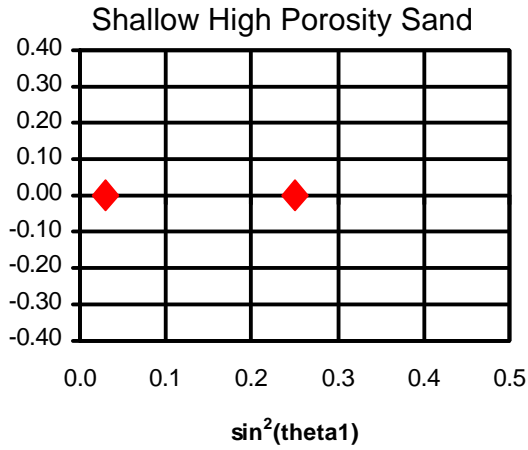
Draw the responses on the worksheet on the next page

Data Sheet

	Lithology	Vp (m/s)	Vs (m/s)	Rho (g/cm ³)
Scenario 1 – Shallow High Porosity Sand				
1	Shale	2499	982	2.24
2	Brine sand	2393	1097	2.083
3	Gas sand	1811	1132	1.71
Scenario 2 – Overpressure (shale on shale)				
1	Shale	3231	1696	2.48
2	Shale	1981	886	2.25
Scenario 3 – Medium Porosity Sand				
1	Shale	2438	1006	2.25
2	Brine sand	3110	1645	2.1
3	Oil sand	2953	1774	2.036
4	Gas sand	2848	1829	1.913
Scenario 4 - Chalk				
1	Shale	2540	1152	2.35
2	40% por chalk	2369	1039	2.026
3	18% por chalk	3747	1951	2.402
Scenario 5 – Deep Jurassic sand				
1	Shale	3208	1593	2.4
2	Brine sand	4054	2407	2.36
3	Oil sand	3942	2437	2.309
4	Gas sand	3923	2467	2.247
Scenario 6 - Permian sand beneath anhydrite				
1	anhydrite	4950	2735	2.75
2	Gas sand	3396	2256	2.298
3	Brine sand	3810	2208	2.399

Note— in the RokDoc_AVO sheet specify near and far angles as 10⁰ and 30⁰

AVO Scenarios Practical - Worksheet



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B) For scenario 3—draw the seismic responses for the models shown below .

